

THE IRON AGE

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SIMPLIFIED PRODUCTION CONTROL AVOIDS DELAYS

By L. T. IVES

The Iron Age, New York

BY eliminating numerous clerical operations and otherwise simplifying its production control procedure, the Sellers company has made possible quicker delivery of both special and standard heavy machine tools. Individual job tickets are no longer used; the workmen receive their instructions directly from permanent operation records. A foreman training program helps to make the simplified system effective.

SIMPLIFICATION of the production control system by discarding individual job tickets while retaining the advantages of a piece-work system of wage payment has resulted in the elimination of approximately 63,000 clerical operations a month at the plant of William Sellers & Co., Phila-

delphia. This, according to the management, has been done without sacrifice of efficiency and has resulted in a marked decrease in the time elapsing from the receipt of an order until actual work in the foundry and machine shop is started.

Of course, the nature of the work done at this

OPERATION SHEET															WM. SELLERS & CO., INC.									
ORDER No.					GRP.-PC. No.					NAME OF PART					MATERIAL									
TYPE OF MACHINE										RATE SETTER														
CUT IN. PER IN.	DRUM. IN.	DESCRIPTION OF OPERATION								MAK. IN.	GAGES, FIXTURES AND TOOLS				RPM FPM	FEED	SET UP	TIME						
																		SET UP	PER PL.					
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3						
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4						
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5						
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6						
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7						
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8						
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9						

COMPLETE instructions for making each part or group of parts used in Sellers' machines are issued on operation sheets of the form shown above. Start and finish times are recorded by clerks on the reverse of the punch card at the left.

plant—the manufacture of heavy machine tools—requires a relatively larger proportion of time to be devoted to engineering design and other paper work than does the operation of a mass-production plant. Many of the machines are built to special specifications although the majority are composed of standard sub-assemblies, only one or perhaps two of these assembly units being special. For this reason, any method by which the amount of clerical work could be diminished without seriously hampering actual production would be of greater value, proportionally, than it would in a shop engaged in continuous production or exclusively confined to large stock orders.

The present procedure of the Sellers company, from the time an order is received until work begins in the shops, has been designed to reduce to a minimum the task of transferring data from the permanent records to job tickets or other blank forms. To explain the system, the course of work from the receipt of an order to the beginning of foundry and machine shop operations will be briefly outlined.

Preparing the Bills of Material

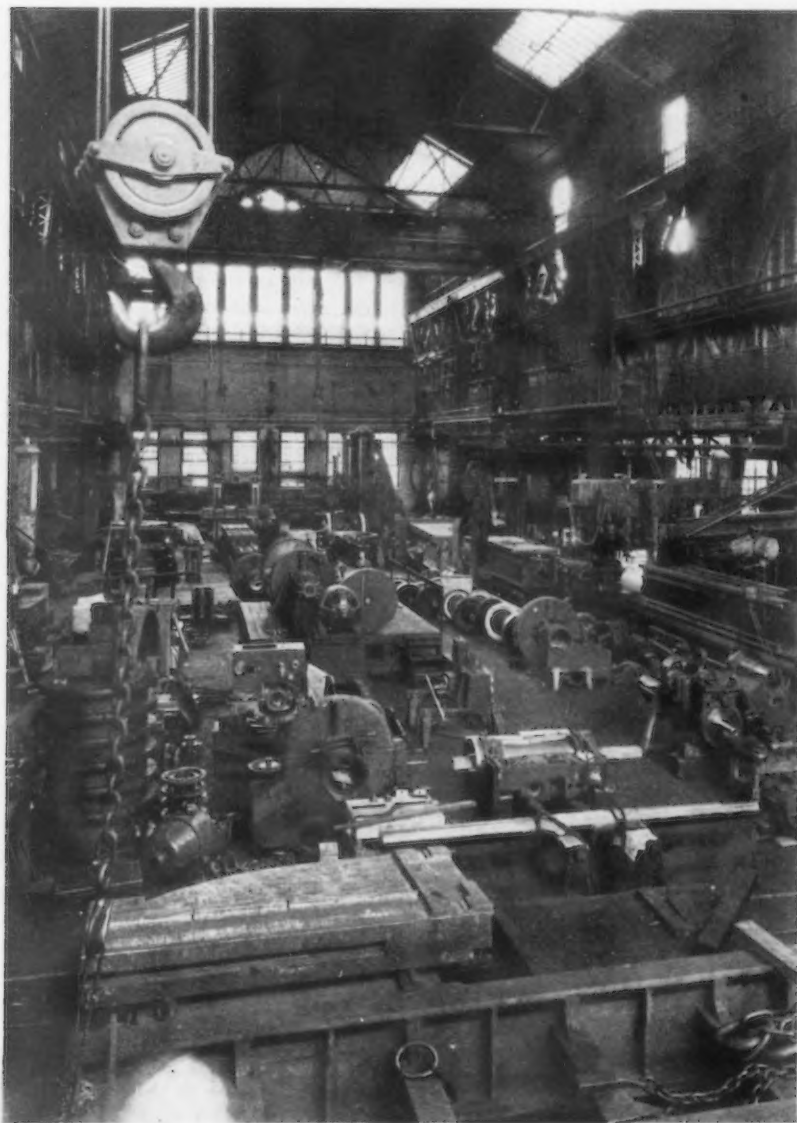
Following receipt of an order, the engineering department issues shop orders; these are typed on yellow paper to distinguish them from the shipping order.

Then bills of material are prepared for the various departments of the plant, including purchasing office, stockroom, foundry and machine shops. Each bill of material covers only those items that are to be handled by the department to which it is sent. For example, the stockroom receives merely a list of the parts to be requisitioned from stock; the purchasing department is sent a list of the material to be purchased. The machine shop, on the other hand, receives a complete bill of material that includes all elements of the completed machine on which any machining or assembly operations are required. Supplementing the stock list is a "cut-off" list enumerating the lengths and sizes of round and flat bar stock to be prepared for the machine shops.

In writing the bills of material, the parts are grouped into sub-assembly units. Thus, even in this preliminary routine work, time is saved by permitting standard bills of material for the various sub-assemblies to be kept in the permanent files, from which they may be removed and blueprints made as required. Complete bills of material for the standard machines are made up entirely of blueprints. In this case the only clerical work required is to multiply the number of each part required for a single machine, as specified on the blueprint, by the number of machines in the order. For special machines, only those sub-assembly units that differ from the standard models require special bills of material to be drawn. For the other sub-assemblies of the special machines, blueprints of the standard bills of material are used as described above.

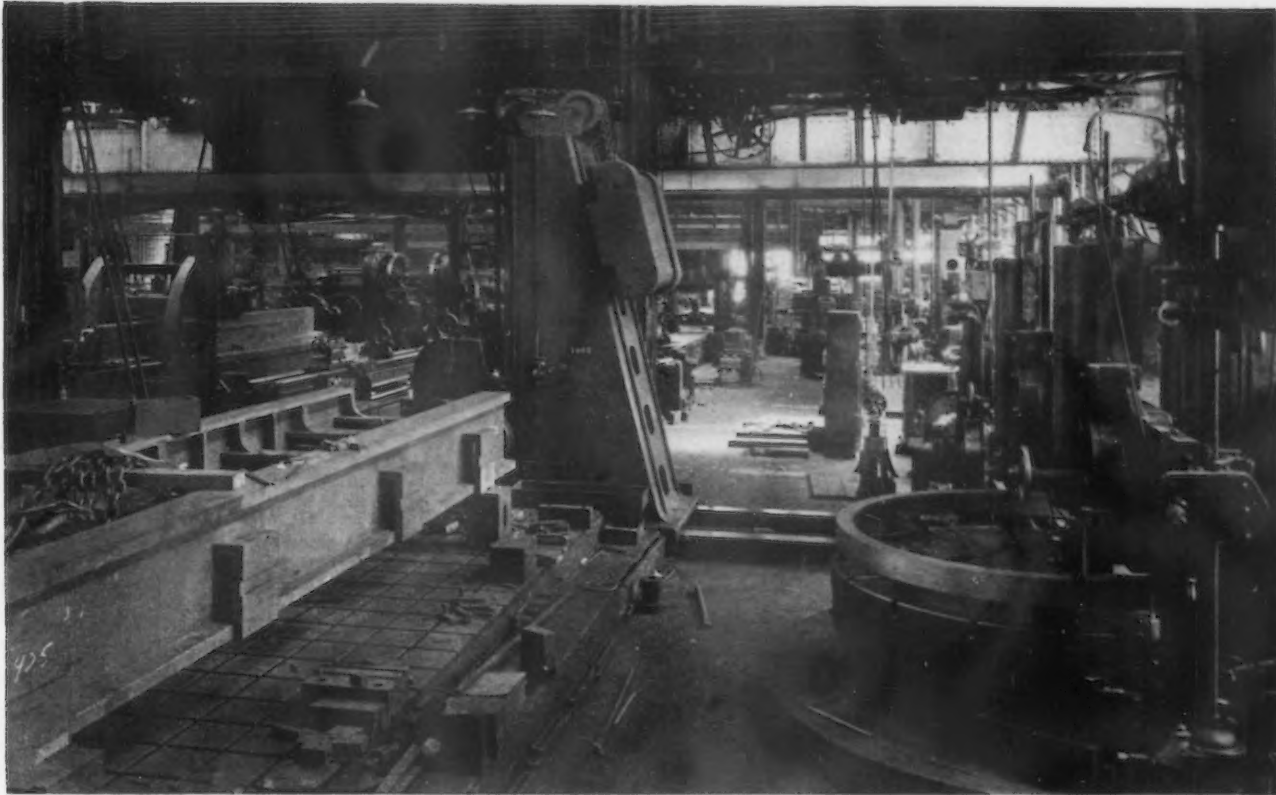
Operation Sheets Replace Individual Job Tickets

Operation sheets form the most important part of the routing system. These, like the bills of materials, are kept in permanent files from which they are removed for use in the shop or for making blueprints if more than one identical operation



INTERIOR views of the plant of William Sellers & Co., Philadelphia. Here the machine to be used, as well as the proper gages and fixtures for each job, is designated on operation sheets kept in a permanent file. This simplification in production control has made possible more rapid handling of the work.





sheet is required. The operation sheet, as may be seen in the accompanying illustration, has spaces in which are noted the name of the part and drawing number, the type of machine for which it is intended, and the material required. In a vertical column the machining operations are listed in proper sequence and are briefly described. Adjacent to the name of the operation appears the number of the machine tool in the shop most suitable for this part of the work. In other columns are listed the gages, fixtures and tools required for the respective operations, the speeds and feeds recommended and the premium time allowed for the set-up and for the machining operation.

Being of letter size, the operation sheets are conveniently kept in standard letter-file drawers where they are arranged by sub-assembly units. A thin white bond paper of good quality is used to facilitate blueprinting. In printing the form, the order number space is blacked out so that a white rectangle appears on the blueprints, in which the number of the current order may be entered.

In general, there is one operation sheet for each part. For greater efficiency in grouping the work to avoid excessive set-up time, however, several similar parts are often listed on the same operation sheet. Thus, for example, as many as four spur gears of nearly identical size and design might be grouped on one operation sheet. In this way, an operator even in machining only one gear of each kind would have a comparatively long job requiring no important change of set-up.

Foremen Control Assignment of Work

Designation of the machine to be used in performing each operation, as specified on the operation sheet,

is not intended to be mandatory. The foremen are required to use their judgment in order to keep the work moving. If one machine in a shop is overloaded, the foreman has the authority to assign work indicated on the operation sheet for that machine to another shop unit. If the latter machine tool is not so well adapted for the work, or if the work is frequently transferred from one machine to another, the foreman will be held strictly accountable for these errors in judgment, as the production department is the original and final authority for the machine loading.

Conduct Training Course for Foremen

In this connection it is interesting to note that the company has placed an additional duty on its foremen, a limited amount of departmental production control; in so doing it has recognized the necessity of eliminating the old-time foreman and bringing forward an entirely new type, trained for his new duties. Although it would appear contrary to the present trend of scientific management, at least in regard to mass production plants, this plan of adding to the duties of the foremen is apparently successful and economical at the Sellers shops, where the problems of production are unlike those encountered in the continuous-production establishment.

To secure the required cooperation from the foremen and to equip them for their production duties, it has been found desirable to establish training courses. Here foremen discuss the problems of their work and receive instruction from experts in production and planning methods. These class meetings are intended to give the foremen a broad view of the work of the shop as a whole, with a special knowledge of production, and thus to enable them to cooperate more effectively in eliminating production delays.

This mention of the foreman training plan has been a digression from the description, here resumed, of the routing system through the engineering department to the shop. After the bills of material are completed for the required sub-assemblies, the necessary operation sheets are removed from the files. Each of these sheets, or a blueprint of it, is placed in an envelope together with the working drawings of the part or parts described on the sheet. The envelopes are then forwarded to a central distribution point in the shop.

It is the regular practice of the foremen to send the operation sheets assigned to their departments to the tool crib where the necessary tools, fixtures and gages are withdrawn and delivered to the operator. In this way the machine operators are not required to waste time in sending or going themselves for the tools they require from time to time. Whenever practical the castings or pieces of stock are also distributed from the central station at the same time as the operation sheets and the tools.

Scheduling Chart Gives Dates for Completion

While the bills of material and operation sheets are being made up by the engineering department, a scheduling chart is also prepared to give the dates at which the various operations are to be completed. These include foundry dates for the various castings that will be needed. Lines on the chart indicate the time allowed for the machining of parts and the completion of the various sub-assemblies. By connecting lines with a main line representing the entire machine assembly program, the chart indicates the dates at

which it is expected that the respective sub-assembly units will be installed on the machine. Large parts, such as the base castings that have no place in a sub-assembly but which are to go directly to the main erection floor, are represented by individual lines on the scheduling chart.

Copies of these charts are placed in the hands of the superintendent and the assistant superintendents; they also are available for inspection by the foremen. By reference to the charts the foremen are able to reassign work in such a way as to expedite the progress whenever extra effort is required to meet an assembly date.

Grouping Work Saves Set-Up Time

When time is available, the foremen are encouraged to group operation sheets in order to keep one operator and machine on the same type of work as long as possible and thus to reduce the number of set-ups necessary. This process of grouping to eliminate unnecessary changes of tooling was almost impossible under the piece-work ticket system of production control formerly employed. Under that system, the work was assigned to a definite machine by the routing department, and foremen were not allowed to alter this routing schedule.

The actual time required by each operator in performing the work specified on the operation sheets is noted on punch cards by the time clerks. Subsequently, additional information, including the wage rate and burden, is entered on the punch cards, from which the payroll and labor cost analysis are calculated by the aid of automatic accounting machines.



Natural Bonded Sands Lower Cleaning Costs

STEEL foundry sand was the subject of two papers at one of the steel sessions at the Chicago meeting of the American Foundrymen's Association. A comparison of natural bonded and synthetic molding sands for the steel foundry was discussed by H. J. Cole, General Electric Co., Schenectady. A paper on steel foundry molding sands and facings was presented by A. S. Nichols, Illinois Clay Products Co., Chicago.

Mr. Cole's paper compared the working properties of synthetic and natural bonded steel molding sands as used in plant practice. Data on the physical properties of the sands and clays used were given. Sample cores were made and tested for strength, permeability, capillary attraction and loss of strength on heating. A comparison of the physical and working properties of the two kinds of sand was included. This indicated that each had some advantages over the other in certain particulars.

In reply to a question Mr. Cole said that his company had reduced cleaning costs by the use of a natural bonded sand and these costs are now much below 90c. per 100 lb., although there were other factors besides the sand that entered into a reduction of the costs. Difficulty was experienced because

of the drying out of synthetic sand, but this was avoided by putting burlap over the sand after milling.

P. E. McKinney, Bethlehem Steel Co., said that the selection of sand was largely a local issue, depending on freight rates. A problem in connection with the use of synthetic sand is the selection of proper clays. He believed that, with good sand control, economies can be obtained with synthetic sand that cannot be secured with natural bonded sand.

The paper by Mr. Nichols included tables prepared from data obtained from 22 steel foundries in the Central West in reply to a questionnaire. One table detailed general practice data, another was a study of 60 different facing sand mixtures and a third gave the exact mix of each facing reported. Various instructive charts were also included.

The author pointed out that, with the wide variety of castings made, many sand mixtures and handling procedures have been developed individually to meet special conditions and conclusions from comparisons on such a basis often are erroneous. However, he believed that much progress can be made in standardization of general sand practice.

STANDARD STEEL SECTIONS USED IN RESIDENCE WORK

CONTINUING the discussion of the use of steel in residence construction, this second installment tells of the developments, during the past three years, in the United States. Many new ideas have come to the fore, but few of them have acquired that following which will be necessary if they are to survive in a large way. Some of the designs here described exhibit great ingenuity in the way steel is used. Standard sections, usually of light weight, and as much shop fabrication as the design permits, are features.

By THOMAS J. FOSTER

Chairman, National Bridge Works, Long Island City, N. Y.

DURING the summer of 1927 National Bridge Works built the floors and roof of a building, shown in Fig. 5, using standard steel shapes on 4-ft. centers, with a shop-made form consisting of plasterboard reinforced with 1 $\frac{3}{4}$ -in. by 1 $\frac{3}{4}$ -in. nailing strips and wire reinforcement. (Fig. 6.) These were placed on the beams and 2 in. of concrete and $\frac{3}{4}$ -in. cement top coat finished the floor, the plasterboard of the shop form making the ceiling shown in Fig. 7. This floor is practically soundproof. The same construction was used in the office building of National Bridge Works in the autumn of 1928.

The Walter Bates Steel Corporation, Gary, Ind., built all-steel frame houses by substituting steel studs and joists for wood. This is shown in Fig. 8. The bracing was made by fastening together the thin strips sheared from one leg of the vertical angles.

At Forest Hills, Long Island, Robert

Tappan erected a steel frame using uprights and floor beams on 4-ft. centers, as shown in Fig. 9. Rods were fastened to the uprights, to which the wire lath was secured. Sheet steel similar to the Naugle house was used on the joists as a form for the thin slab of concrete.

A most elaborate scheme for placing steel in residences was that of the Steel Frame House Co., Pittsburgh. Many homes were built and representatives were selected throughout the country to sell the construction. The object was to use standard building materials in conjunction with a steel frame, as shown in Fig. 10.

This is in principle the method followed by nearly all users of steel in residence work. The Steel Frame House Co. seemed perfectly equipped to make a success of this method, but apparently the potential market for such construction is not at this time

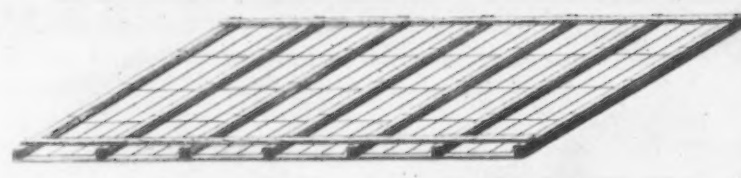


FIG. 5.—Applying precast gypsum slabs on the steel framed roof of the post office at Easthampton—a small building of residential type of construction.



FIG. 7.—Beam and plasterboard ceiling in Long Island City office of National Bridge Works. This type of ceiling, particularly suitable for residential use, was made with the aid of forms such as those in Fig. 6.

FIG. 6.—(at right) Shop-made form of plasterboard with wooden nailing strips and wire reinforcement, for a concrete floor slab in a residence.



sufficiently developed to warrant continuing in business on the scale originally proposed.

None of these people are building steel-frame houses at present, though some of them are still furnishing parts. The Jones & Laughlin Steel Corp. furnishes J. & L. Junior beams for the first and second stories of buildings and put its construction into

about 250 houses during 1930. The Walter Bates Steel Corp., Gary, Ind., furnishes steel joists. The Steel Frame House Co. also furnishes its specially designed steel for homes.

The personnel of those furnishing steel for residences has changed considerably, even during the last year, as is to be expected in pioneer work of this sort.

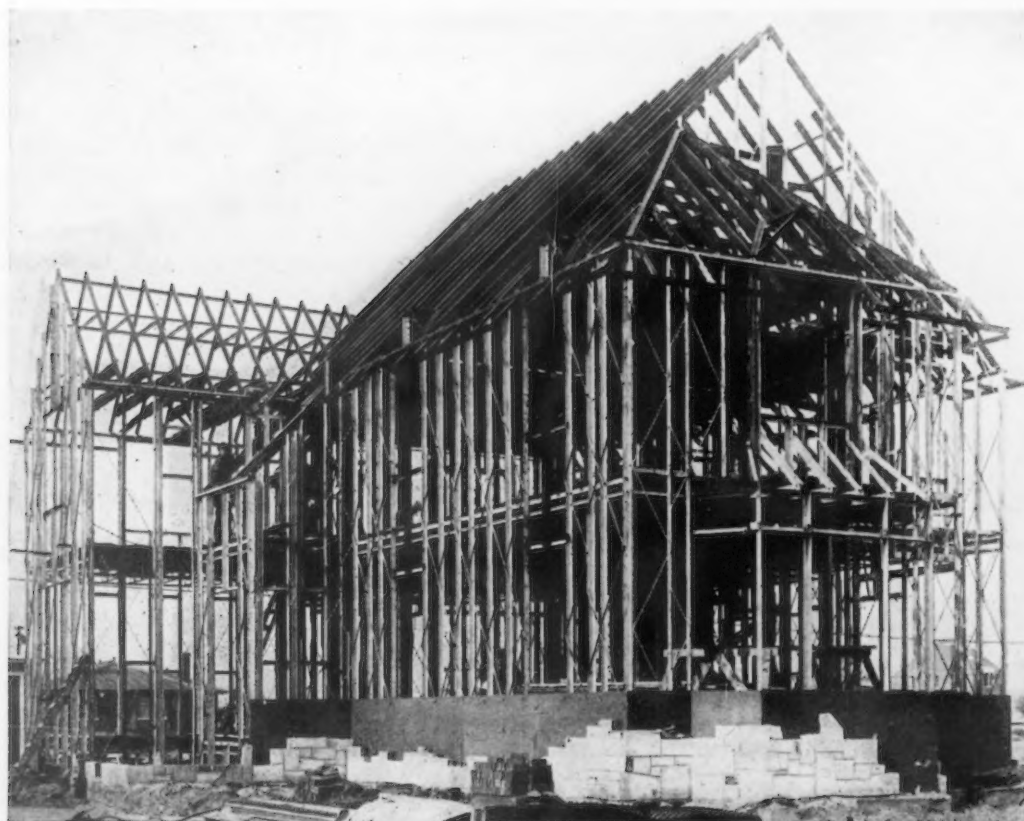


FIG. 8.—Steel frame house built by Walter Bates Steel Corp. As shown, this structure is ready for the insulation slabs and facing. The steel framing shows no radical departure from that usual with wood.

It is difficult to locate all of the companies in the United States that have helped to develop better buildings through the use of steel, but those in the following paragraphs are actively engaged in this work:

The Colorado Fuel & Iron Co., Denver, gives the following account of its system:

The Minnequa System (see Fig. 11) provides an economical method of detail and assembly drawings for bolting steel members together, one story at a time, until the entire framework has been erected.

Girders are placed on the foundation by aid of an "A" frame or gin pole.

Floor joists are spaced at 4-ft. intervals. The walls crosswise of the joists are framed by placing the studs on top of the joist, while lengthwise the studs bear on the foundation wall, spaced 4 ft. apart. Angles line up top and bottom of the studs, spacing studs and joists. Girts frame window and door openings. Diagonal rods tightened to adjacent studs with turnbuckles provide lateral bracing. Ceiling joists are set up in the same manner as floor joists, except that they are supported by the short wall studs. Steel strips laid above the ceiling joists tie the diagonally opposite corners of the structure and afford secure bracing. Tie rods are used for bridging floor and ceiling joists.

The sub- and finish floors are laid from wall to wall over 2-in. by 4-in. wood sleepers fastened to the steel joists by small clips and wood screws. Concrete may be poured on paper-backed steel fabric stretched across the joists and the finish flooring nailed to wooden screeds set in the concrete. Ample space is provided for piping and



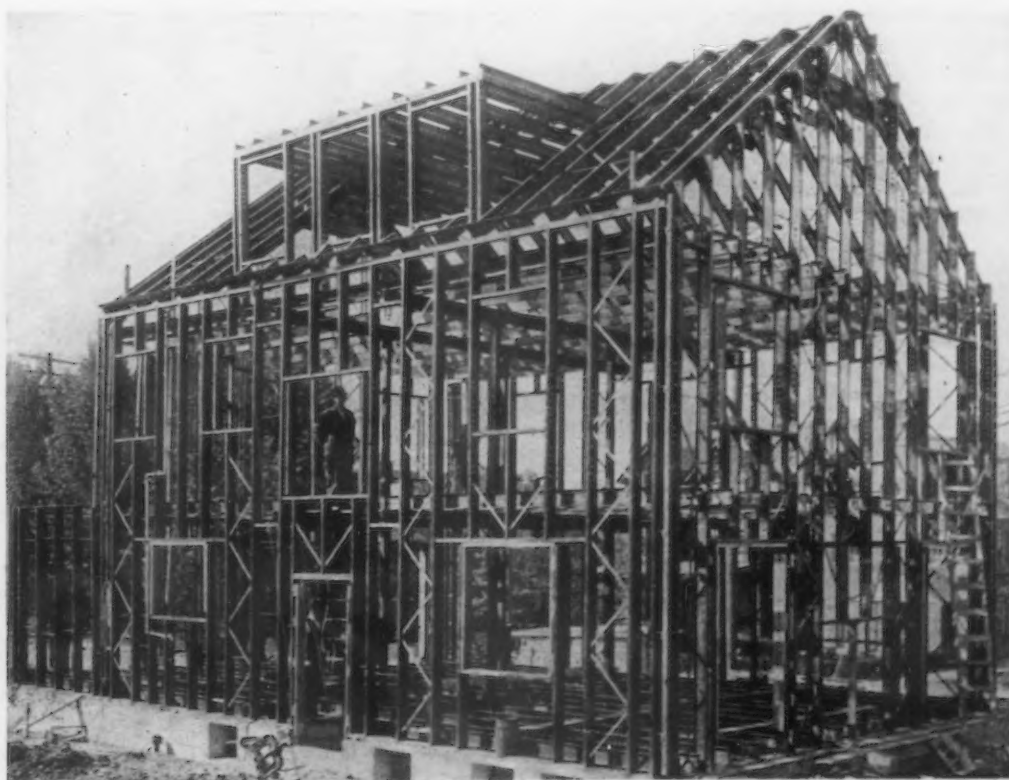
FIG. 9.—Steel frame house at Forest Hills, Long Island, as developed by Robert Tappan. This shows much wider stud spacing than the house in Fig. 8, giving effect to the great strength of steel.

wiring without cutting through the floor joists and wall studs.

Steel partition studs rest on the finished floor and are fastened by screwing through a head clip if gypsum board is used, or bolted to light angles fastened to the ceiling joist if steel fabric and plaster is used. Partitions may be arranged after the framework is erected.

For the exterior, paper-backed steel fabric or $\frac{3}{4}$ -in. gypsum boards may be fastened to the studs, and stucco or brick veneer may be used.

FIG. 10.—Design developed by Steel Frame House Co., Pittsburgh. In this case perforated steel members are a great help in erection.



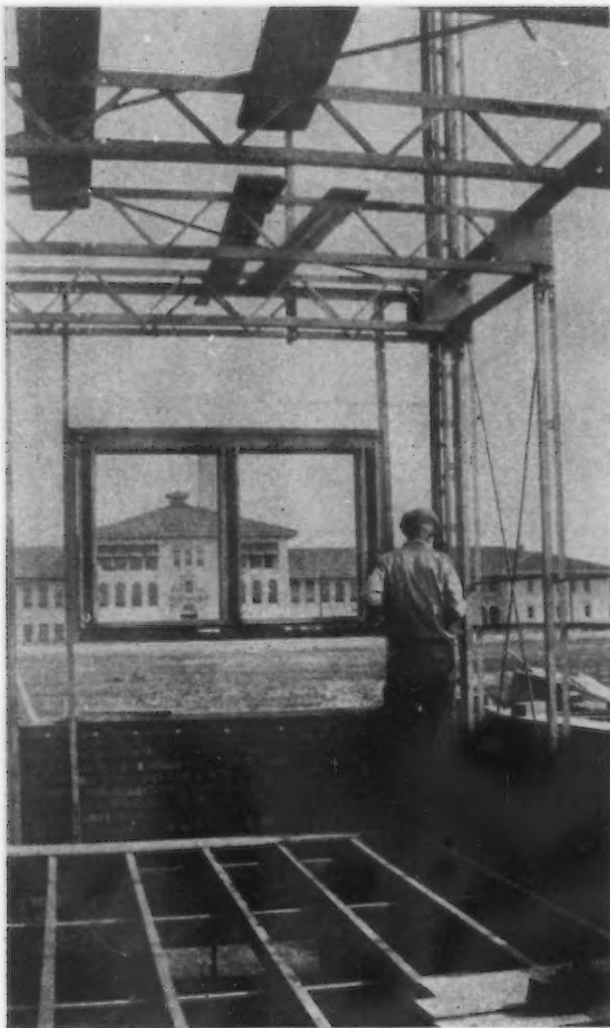


FIG. 11.—Minnequa construction developed by the Colorado Fuel & Iron Co., in which steel members are bolted together one story at a time until the entire framework has been erected.

The Junius H. Stone Corp., New York, built a residence and a parish house in Port Washington, using light angles with cork slabs attached. Stucco was used on the exterior and plaster on the interior. This company, which has built a similar house at Riverdale, (shown in Fig. 12) and five at Scarsdale, N. Y., gives the following description of its "Corkan-stele Flexible Construction":

A main girder is run either front to rear, or longitudinally, as preferred, with one middle post supporting it, and the main partition of the house naturally runs under this girder. This is the only partition that forms any part of the building structure proper. All other partitions are panels set in place with a shoe top and bottom, and may be removed, or their locations changed, as desired. In other words, any one purchasing a house of this type, who does not like the arrangement of the rooms, can, without destroying anything or going to any considerable expense, take out all his partitions except the central one, and rearrange the rooms to suit himself.

Floor beams, of course, can be either wood or steel, so that the floors can be cement slabs or wooden construction, as preferred.

The Steel Bilt Homes, Inc., Cleveland, Ohio, successor to McKay Fireproofing Co., is using the same method as described above for the Minnequa system. This company has been building structural steel frame houses for a period of three years, has two houses under construction, and looks forward to a steadily increasing business.

The Scullin Steel Co., St. Louis, gives the following description of its integral welded unit system of steel frame construction:

The steel members are manufactured in the rolling mill, cut to proper size, transferred to the assembly yard, where plates are welded to the members when required, marked, and transferred to the building site. No bolts or rivets are used in this construction. The structural members are light, standard hot-rolled sections. (See Fig. 13.)

The foundation is the same as for ordinary construction, except that anchor bolts and steel bearing plates secure the steel structure to the foundation. Two channels are placed flange to flange and spot welded, forming a tube section surrounding the entire foundation, and secured thereto by anchor bolts. Angles are welded to the interior web of the channels, forming a bearing seat for the first floor I-beams, spaced in even multiples, to which are welded the corrugated steel plates for sub-floors. A hot mastic cement is properly leveled on this surface and any fireproof flooring material can be applied.

The exterior walls are standard beams spaced in an even multiple with the floor beams, welded



FIG. 12.—Steel frame house with cork insulation—called Corkan-stele—erected by Junius H. Stone Corp. at Riverdale, N. Y.

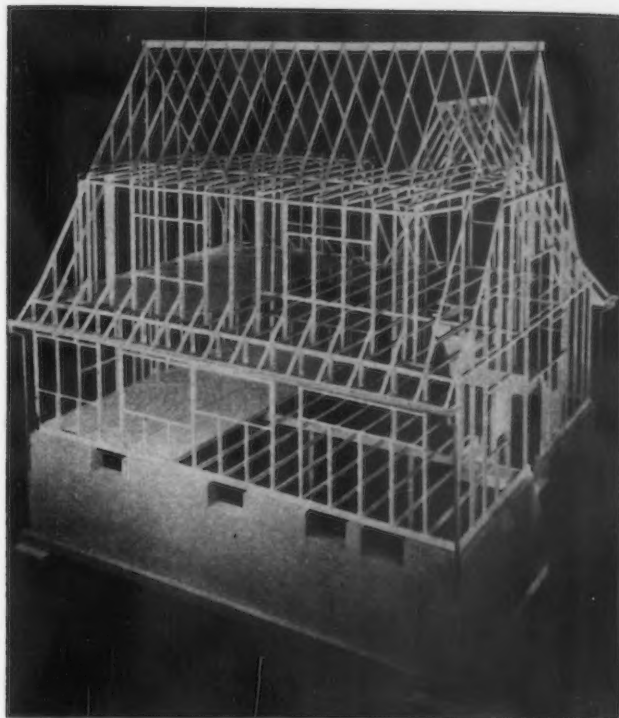


FIG. 13.—Steel frame and corrugated flooring base, as developed by the Scullin Steel Co., St. Louis. This illustration is from a model.

to the foundation beams and to the separating tube channels of the floor.

Interior walls are finished with plaster, applied to reinforced expanded steel lath spot welded to the exterior vertical beams. The same material spot welded to the floor beams is used for the ceiling. All partitions are non-bearing and any fireproof and soundproof material can be utilized. All exterior and interior finishes and trim are of metal.

The roof rafters are standard channels.

"After the steel framework is properly anchored to the foundation unlimited combinations of materials may be applied to form the exterior finish.

(To be continued)

▲ ▲ ▲

Normal Requirements for Residential Construction

ACCORDING to an article in a recent issue of *Annalist*, New York, the straight-line trend for residential construction, based on the record of the past 16 years, is moving upward from about 13,000,000 sq. ft. monthly, at the beginning of 1915, to 40,000,000 sq. ft., or more than three times as much, by the end of 1935. Maximum production of residential floor space was in 1928, at something more than 47,000,000 sq. ft. monthly, closely approached by a similar figure for 1925. In 1930 the amount was down to 19,000,000 sq. ft., with a forecast of 24,000,000 sq. ft. for 1931 made by F. W. Dodge Corp.

Aside from this straight-line trend the author of the article, John R. Arnold, has calculated a normal line which shows an almost imperceptible upward trend

from about 26,500,000 sq. ft. in 1915 to 28,500,000 sq. ft. at the end of 1935. The normal provision for new population, forecasted into the future, is based on a mathematical curve for population growth. Explaining the slow rate of long-time growth, the following considerations were brought forward in the article:

Volume of new housing required is dependent not on total population but on additions to the population, and these may stand still or decline at times. Additions for the larger communities, which contribute disproportionately to the volume of residential building, have already begun to decline. This leads to acceptance of a slow contraction on that part of the volume dependent on new population—nearly two-thirds of the total.

Dwellings tending to become obsolete, and consequently determining the volume of replacements, were mostly built when additions to the population were increasing rapidly. This part of the demand, therefore, appears to be increasing a little more rapidly than enough to offset the decline in the provision for new population. This results in a slow expansion of normal volume, and such a slow growth is believed by the author to be likely to continue.

▲ ▲ ▲

Substitutes for Tin Not Easily Found

The widespread opinion that the reserves of tin, marketable at about current prices, are limited encouraged for many years research for substitutes. The relatively high price of tin in comparison with that of most of the common metals proved an added incentive to substitution, according to Charles W. Merrill in a report of the Bureau of Mines.

No tin-free container has been developed as yet that can offer serious competition to the tin can. Glass containers have been used successfully where the advantage of display of contents outweighed higher initial cost and difficulties of transportation.

Experiments have been made with stainless steel cans, but the high cost and difficulties of opening have made their use uneconomical. Research to develop a practical aluminum can continues. Research in the substitution of lacquers for tin in the manufacture of tin cans has made little progress because of the difficulty in obtaining an appearance of cleanliness and beauty equal to that of the tin as well as the difficulty in duplicating the purely utilitarian qualities of the tin coating.

In the manufacture of alloys the aluminum brasses have displaced some of the tin-bearing bronzes, but in the making of other bearing metals and solders the displacement of tin seems to have been of little importance. The savings effected have depended upon a more economical use of the alloys. Attention has been given to decreasing the amount of tin alloy entering bearings, and joints to be soldered are being fitted more carefully to avoid unnecessary filling in with solder.

Aluminum is being used as a substitute for tin in the manufacture of foils and collapsible tubes. Moreover tin foil is meeting severe competition as a food and cigar wrapper in "cellophane," a transparent cellulose product, and in various waxed papers.

PREPARATION AND DISTRIBUTION OF CORE SANDS

By H. L. McKINNON
Secretary, C. O. Bartlett & Snow Co.

CORE sands may be classified as: (a) Sands suitable for green sand cores in light castings, (b) sands for green sand cores in heavy castings, (c) sands for dry sand cores in light castings and (d) sands for dry sand cores in heavy castings.

Sands for green sand cores in light castings should be of small grain size and contain a high percentage of clay. In fact, sand of this kind should correspond with class (b) sand for molding purposes and quite frequently the same grades of sand are used for both mold and core.

Sands for heavier work would have coarser grain size and, if used for green sand cores, require a high percentage of clay content. The usual base for dry sand cores consists of an almost pure silica and the grain size should correspond with the size of the work to be made.

Sand for dry sand cores in heavy castings should be similar to that in (c) except that the grain size should be coarser. In the green sand work the bonding material should have a refractory quality satisfactory for the temperatures to which the same are subjected. The preparation of core sands involves the addition of various materials, although for green sand cores the mixing is substantially the same as for molding sand of the same character.

Variety of Binders Makes Selection Important

For the dry sand cores the nature of the binders used is quite different from that used in the preparation of molding sand. These binders should be selected so as to render the sand most satisfactory for the particular purpose for which they are intended.

One binder much used in connection with dry sand cores consists of vegetable oils of which usually linseed forms a base. Oils of this character increase the strength of the core material during the drying process and then later, if subjected to the high temperature of the molten metal, lose their cohesive properties, which permits easy removal of the core after the casting has cooled.

In the case of dry sand cores that are easily removable after the casting has been made, materials may be used which give greater strength than that

produced by the use of oil. For this purpose pitch, molasses, etc., represent a type of binder which may be incorporated in the sand. It is important that the materials used to obtain the necessary strength in the core should permit the exit of gases formed in the mold at the time of pouring.

The most general means used for the mixing of core sand with the various compounds, consists of a paddle mixer which in its essential parts is a semi-circular steel trough carrying a shaft with paddles and spiral blades. The trough may either be arranged to rotate so as to dump from the top, or it may also be provided with a bottom door which may be opened for discharging the mixed product.

In practically all cases the mixing is done in batches, that is, a definite amount of sand is placed in the mixer and the various compounds added in the quantities desired. Frequently a little water is also added to the mix. When this has been subjected to mixing action for a definite period, it is dumped and is ready for use.

In some cases standard mulling machines are used to accomplish the same result. This is especially true where concentrated clay binders are added in green sand work, as a more intimate mixture can thus be obtained.

Distribution and Continuous Drying

The means for handling the cores immediately after making are varied. Cores that have one flat surface are usually placed on core plates or pallets on which these cores are handled, until after the drying has taken place.

Many cores, which do not have a flat surface and therefore cannot be laid on a plate of this kind when green, are mounted in drying pallets or forms which correspond in general with one half of the core box. These forms are later placed on core plates or other carriers. Core plates and dryers are usually perforated as so as to provide for circulation of hot air around and through the cores, to assist in the drying operation.

Many of the larger cores are now made on molding machines and squeezed much the same as an ordinary mold. In most instances a rollover attachment is re-

ANALOGOUS to the problem of preparing and handling molding sand in the foundry is the preparation and handling of core sands.

Mr. McKinnon's description of modern methods of handling sand for molds and its preparation and reclamation was published in *THE IRON AGE* of July 30 on pages 312 to 314. In this article, he describes the methods applied in up-to-date foundries in connection with core sands.

This article, as the previous one, is based upon a paper presented by the author at the semi-annual meeting of the American Society of Mechanical Engineers.

quired for the drawing of the core and they are carried off on dryer plates to the drying ovens.

Handling Cores Through Five-Deck Ovens

In one very large recent installation the dryer plates have been of large size, approximately 6 ft. square, and cores are laid on these plates as they come from the machines. The plates are then transported on gravity conveyors to a position in front of a continuous drying oven. The plates are charged into the drying oven by mechanical equipment, which is arranged to deliver on any one of five decks, which this continuous oven contains. These five decks are each provided with individual driving equipment for propelling the plates continuously through the dryer, and the drives are so constructed as to give a variable time in passing through the dryer. In this manner, by the segregation of lighter cores on one deck and heavier cores on another, the required time for the drying of each size of core is usually approximated, so as to do it economically.

At the opposite end of the drying oven mechanical means are provided for unloading the trays, placing them on gravity lines at the foundry floor level, from which the cores are readily removed and taken to the individual jobs for which they are intended.

In some cases a carrier system is provided, running past the core benches or machines, as the case may be, and the cores are allowed to collect on trays suspended on the carrying unit.

Where cores are of uniform size, requiring approximately the same time for drying, it is very easy to continue the unit directly through an oven of the proper type, either vertical or horizontal, and achieve the proper drying result without ever stopping the core until it is ready for removal or for use.

The methods indicated represent the minimum of handling and therefore the maximum of efficiency in taking care of these operations. In many cases where continuous ovens are not in use cores are collected in portable racks, which in turn can be moved about on lift trucks and placed in the intermittent-type oven, which is still much more largely used than any of the continuous types.

This method of drying has many inherent advantages, first of which is that cores may be classified on different racks and placed in different ovens for various purposes. The racks can be carried by means of lift trucks to the proper position for use in the foundry,

if due regard to such transportation is provided for in the layout of the balance of the plant.

Drying Means and Temperature Control

The means which are today used for drying are quite varied. Probably the most common application of heat is by means of oil burners with controllable draft. Next in point of importance in its general application is the use of coke fire in pits under a battery of ovens. In some cases natural gas is used, while in others, electric heating units are applied with very good results.

The proper temperatures to be maintained for drying cores vary with the character of the binder which is used, and the nature of the work which is to be done. These temperatures range from 350 deg. F. up to 700 or 800 deg. The higher temperatures involve problems of a rather difficult nature, especially in the continuous oven, as it becomes increasingly difficult to maintain mechanical parts to be used for the moving of the trays, or core plates, through such a heated atmosphere. It becomes a practical impossibility to maintain lubrication in such temperatures.

Science attempts to solve these problems as they arise and various alloy steels have been used so as to operate under these difficult conditions. The handling of cores after drying is on the whole a very simple operation, since if they are properly made and dried, resistance to breakage is high and they may be readily transported on trucks, wheelbarrows or on conveyors.

The amount of equipment for use in the distribution of cores bears some relation to the quantity of cores to be handled. It would be very foolish indeed to spend many thousands of dollars for an elaborate conveyor equipment to serve for the distribution of cores, if the total tonnage of cores to be handled in any given day were small. On the other hand, it can readily be determined that mechanical equipment is of great value where the volume and weight of the cores to be delivered runs high for the operation in question.

Reclaiming of Core Sands and Other Dry Sands

For many years it had been assumed that, after sand had been baked into a core with various vegetable products which had been mixed into the sand before baking, such sands were practically without value after once being used. The reason for this was due to the difficulty of knowing just exactly how much of this foreign material remained in the sand after a single

use. It was therefore assumed that to make uniform cores it was necessary to start with virgin sand.

In recent years, however, progress has been made in the reuse of a certain amount of core sand. It became necessary to crush the cores back to the original grain size, separate wires and rods by means of magnetic separation, and then screen the sand very carefully, either through a double-deck vibrating screen or through a single-deck screen, with air separation as a means for assisting in the removal of the various fine particles which became loose from the grains of sand in the crushing operation.

When this means is employed it is quite possible to decrease the amount of new core sand required to approximately half of the amount formerly used, that is, about half of the reclaimed sand may be mixed with an equal amount of new sand, if the reclaimed sand has been properly cleaned, and obtain a satisfactory sand for the production of cores.

In some cases washing equipment has been resorted to. This is very effective in cleaning the reclaimed sand, but involves drying to get rid of the excess water which is introduced in this process. In some instances the cost of these operations is greater than would be the case to purchase new sand, in which event there would be no economy.

In many cases, however, freight rates and other conditions make new sand quite high in cost, and, under these circumstances, even washing and drying equipment may be much less costly than would be the case if new core sand were used entirely.

In some instances a certain amount of the core sand is crushed and allowed to go into the molding sand in the foundry. This has the result normally of opening up the molding sand, or increasing its permeability and somewhat decreasing its strength. Where a concentrated bonding material is being added this frequently is no detriment to the sand. The same problem occurs in connection with dry sand molding to some extent, except that there is not the same amount of liquid of a vegetable nature added to the sand, but bonding material is added, and when the mold has been subjected to a high temperature for drying purposes the result is a number of hard lumps which must be crushed in some manner before the sand can be reused.

Suction Applied During Tumbling

Various types of crushing equipment have been applied to this problem, but one of the most satisfactory consists of tumbling the lumps in a cylinder with lifting flights on the inside walls, cascading the material over itself until it has been reduced practically to grain size. If a slight suction is applied during this process, and the fine dusty material removed by means of suction, a very satisfactory clean sand may be obtained after screening and magnetic separation.

Crushers of the hammer-mill type can be used to accomplish this result also, but part at least of the screens must be removed from the crusher to allow the rods and gaggers which are found in these dry sand lumps to be passed through the machine without breakage.

▲ ▲ ▲

Secondary Sources of Non-Ferrous Metals

THERE has been a progressive increase in the proportion of lead and copper originating from secondary sources. An article in *Mining and Metallurgy* by W. A. Scheuch, metallurgist, Western Electric Co., shows that in the 20 years from 1910 to 1929 the percentage of lead obtained for such sources increased from about 12 to about 30. Meantime the copper percentage advanced from about 15 to 39, but was considerably higher in 1921. He suggests that the secondary sources have become so important as to justify well designed and carefully located units capable of producing high-quality products. He finds that the quantity of copper and lead available from secondary sources annually amounts to more than the primary copper produced in Arizona (the leading copper State) and the primary lead produced by Missouri (the largest lead State).

Copper available from secondary sources in the United States amounts to about one-half the annual consumption, but covers only about one-third of the total of the smelter output of primary copper from domestic sources plus copper available from secondary sources, indicating, of course, the large exports of copper.

Lead available from secondary sources in the

United State amounts to about one-third our annual consumption.

To effect the greatest possible economies to industry, the author states that the reuse of secondary metals undoubtedly will require development of new refining processes and adjustment of the specifications for alloys. The large quantity of secondary metals cannot be disregarded in any attempt to reduce the stocks of metals on hand. Data on copper for 1921 indicate that, during periods of economic depression, the output of metal from secondary sources tends to continue at more nearly a normal rate than does that from primary sources.

Consumption of metal per person is going up. Figures of the American Bureau of Metal Statistics, shown in the table, indicate that the per capita consumption of copper has almost precisely doubled from the average of 1912-1914 to the average of 1928-1930, a period of 16 years. Meantime per capita consumption of lead advanced about 23 per cent.

Pounds Consumed Annually per Person in the United States

Average of	Copper	Lead
1912-1914.....	8.09	9.01
1919-1921.....	9.79	9.07
1922-1924.....	12.17	10.79
1925-1927.....	14.56	12.24
1928-1930.....	16.01	11.04



Ewing Galloway

▲ ▲ ▲
LOWER away! The final test of the skill of craftsmanship in assembly of structural beam and column is about to come. The odds are that the parts will fit; otherwise a floor a day would not be a common accomplishment in structural building erection. Must be a source of pride to these skywalking structural workers to point to a giant skyscraper and say "I helped to build it!"

SCUM CAUSED BY ALUMINUM

EXCESS of aluminum in the galvanizing bath is sometimes responsible for a formation of scum on the surface. This is deleterious to the quality of the product and must be avoided. Correct proportioning of the aluminum addition will go a long way toward obviating this trouble. There are, however, other factors present which have to be accounted for if proper operation is to follow.

By WALLACE G. IMHOFF

Consultant in Zinc Coatings (Hot Galvanizing) Vineland, N. J.

SCUM in hot-dipped zinc coatings is a very important subject to all hot-galvanizers who depend largely on appearance for the sale of their products. Scum has sometimes been called "scruf" or "dirt," depending on whether it is of a thick, scummy nature or a more or less powdered, or dirt, character. When it is of the "dirt" character it is sometimes called "oxide" in the coating, which indicates that it is a product of oxidation.

To correct this defect in hot-dipped zinc coatings it is necessary to understand very clearly what it is, and how it is formed. It is also essential that the different varieties or kinds be recognized.

Ordinary zinc oxide formed on the galvanizing bath surface is a light, yellow powder. It is usually fairly fine in quality, and is filled with metallic zinc particles from the bath. If this oxide is burned on the bath with ordinary sal-ammoniac, a gas is given off which can be ignited. The heat thus generated will heat the oxide skimmings hot enough so that a large part of the metallic particles will again go back into the bath.

This is the usual practice, in some plants, of treating the skimmings. The effect on the color of the oxide is to change it to a dark olive green, or to a brown color. This oxide is in the form of a very fine powder.

Blue Scum Comes from Aluminum

There are times, however, when this surface oxidation of the galvanizing bath takes on a bluish color, and the product formed is scummy. In some cases it may even be of a crumbly nature. Anyone observing

this material closely will see that it is not like the yellow oxide powder formed from zinc. This scummy material is generally found when large additions of aluminum have been made to the bath, or when some commercial metal addition is used to keep the bath clear of oxidation and improve the spangle and brightness of the coating.

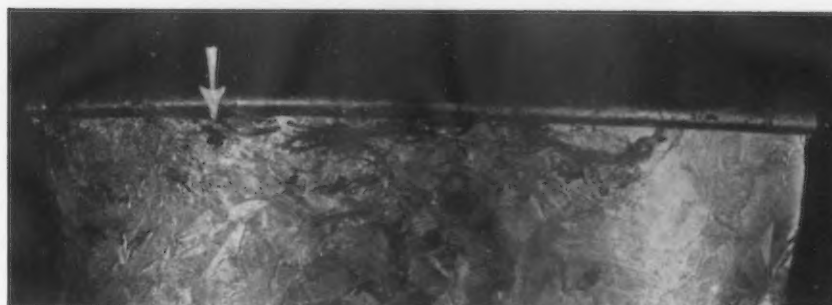
The blue scum is from aluminum and is caused by an excess of aluminum in the galvanizing bath. Various amounts of aluminum are used in the bath, depending upon a number of operating conditions, such as temperature, production, surface area of the articles galvanized, etc.

The scum, scruf, dirt or oxide, as it may be called in galvanized coatings, then is seen to be due to the oxidation of the bath. When the oxidation product is largely composed of zinc oxide the material is in the powdered form and of a yellow color. When aluminum and metal additions are used in the bath, the oxidation product then becomes of a character known as "scum," "scruf" or "dirt."

The yellow oxide powder is very dry; it usually will not stick or adhere to the coating. As a general thing the bath will also "take" or galvanize, even with a large amount of this yellow powder on the surface of the bath.

"Scum" and "scruf," on the other hand, formed when an excess of aluminum is in the bath, will stick very tightly to the article when drawn up through the bath. In some instances the bath does not "take" at all. If the "scum" or "scruf" be rubbed off, or cleaned off with a file, the bare steel is seen under-

IN HOT-DIPPED ZINC COATINGS



Note bare spot in coating on left side, near rim, as indicated by the arrow at top. This is on an ordinary water pail and illustrates the desirability of using care in the bath.

neath, and there is no protection offered to the base metal. This condition makes it very important that this material be not formed in the first place, or if it does form means should be taken at once to stop it.

How Much Aluminum to Add

Since the cause of the scum is excess aluminum, the first precaution should be taken, in making aluminum additions, to see that only the right amount is added to the bath. The question then to be answered is: "How much is the right amount?" This cannot be specifically answered, since the amount of aluminum necessary is a direct function of the bath temperature carried, the surface area of the material to be coated, the production put through the bath in a given unit of time, and the other metal additions made to the bath.

As to the amount of aluminum used, it is of practical interest to discuss the aluminum content in some baths in operation. In an electrical conduit bath very little, or no, aluminum at all is added. The bath from a range boiler installation showed 0.004 per cent aluminum. A bath in which metalware was hot galvanized showed an aluminum content of 0.16 per cent; a pipe galvanizing bath showed an aluminum content of 0.04 per cent. The average for all baths might possibly be around 0.05 per cent aluminum content.

It is of practical interest to discuss the purpose of adding aluminum to the galvanizing bath. The use of aluminum in the bath was known at least as long as 40 years ago, since United States patent No. 456,204, dated July 21, 1891, was granted to Joseph William Richards, of Philadelphia.

He made the aluminum additions in the form of an

aluminum zinc alloy, since metallic aluminum is hard to dissolve in the bath. The composition of the aluminum-zinc alloy is not given, but it is stated that about 4 oz. of the aluminum-zinc alloy was added to the ton of melted zinc. The alloy was known as "Brilliant Metal Flux." The purpose of adding the aluminum was to give the coating a brilliant lustre and to keep down oxidation of the bath.

Aluminum Brightens the Product

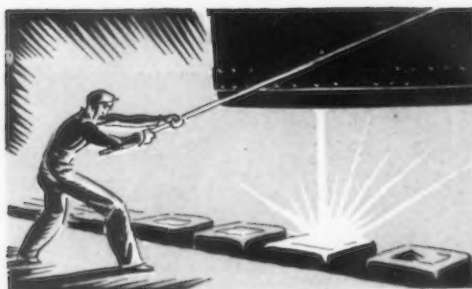
At that time little was known with regard to the use of aluminum in galvanizing baths. Since then, however, much research work has been done and the effect of aluminum additions to a bath is fairly well known; at least as regards the brightening effect, and the effect upon keeping down the quantity of zinc ashes made.

Even today, however, the practical aspect is not entirely clear in many respects. For example, while it has been known that aluminum additions in small amounts keep down surface oxidation of the bath, it is not so well known and understood that large additions of aluminum increase the amount of oxide skimmings very much, and that, as a result of this large excess of blue, scummy oxide skimmings, a very inferior coating may result.

The effect of an excess of aluminum in the bath is noted in a practical way by the formation of a heavy scum on the bath. No matter how much the surface is cleared, the opening closes up quickly again with this scum. It is almost impossible to draw the work up through the surface and have it clean. The scum

(Concluded on page 461)

CHEMICAL COMPOSITIONS OF



SINCE the early days of modern steel production, the intermediate phase of ingot making received comparatively less attention than any other stage in this important industry of today. Too little progress has been made in the field of ingots and ingot molds, regardless of the general tendencies toward metallurgical and economical improvements in almost all other divisions of the modern steel plant. Perhaps, the most conclusive proof for this statement may be found in the large deviations and practices relating to the chemical composition of that part, which is so important in the production of sound ingots at favorable cost—the ingot mold. A glimpse at Table I

gives a limited idea of this condition in some of the world's leading steel producing countries.

To stimulate attention to this item, the author of this report investigated the prevailing conditions in the field of ingot molds with a view to determine the most marked influences of the various chemical elements upon the serviceability or life of ingot molds. This rather exhaustive survey revealed the astonishing fact that many otherwise well-established and well-known principles of one manufacturer or industrial country were practically unknown to others. Patents were issued in a few cases on chemical compositions and processes of manufacture which were long before utilized and

Table I: Chemical Analysis and Life of Ingot Molds Made in Various Countries

Grade of steel teemed into mold	Molds made of Cupola Iron: Analysis of Mold Metal, per cent						Life of Mold, Heats	Mold cast and used in
	Total C	Si	Mn	S	P	Cr		
Basic O.H.	3.84	1.63	1.20	0.038	0.216	...	137	U. S. A.
Basic O.H.	...	1.34	0.96	0.046	0.117	...	119	U. S. A.
Basic O.H.	3.24	1.96	1.43	0.030	0.098	0.15	181	U. S. A.
Basic O.H.	3.30	1.89	0.85	0.063	...	...	140	Germany
Acid O.H.	...	1.77	0.91	...	...	...	98	Sweden
Acid Bessemer	3.60	1.57	1.03	0.050	0.112	...	92	U. S. A.
Acid Bessemer	3.37	1.69	0.96	0.078	0.172	...	123	England
Basic Bessemer	3.78	1.90	1.10	0.040	0.166	...	177	Czechoslovakia
Basic Bessemer	4.11	1.03	0.93	...	...	...	151	Belgium
Electric	...	1.53	1.22	0.054	0.180	...	129	U. S. A.
Electric	4.29	1.31	1.06	0.044	0.156	...	158	Austria
Electric	0.38	0.32	0.73	0.041	0.029	...	226	(Steel mold)
Electric	0.43	0.27	0.88	0.021	0.032	...	246	(Steel mold)
Molds made of Direct Metal:								
Basic O.H.	3.91	1.09	0.91	0.038	0.140	...	54	U. S. A.
Basic O.H.	...	1.55	0.92	0.027	0.101	...	74	U. S. A.
Basic O.H.	...	1.77	1.09	0.052	0.108	...	87	France
Duplex	3.70	2.01	0.84	0.055	0.120	...	69	U. S. A.

INGOT MOLDS

By JOHN H. HRUSKA
Metallurgical engineer, Berwyn, Ill.

NEED THOROUGH REVISION

MANY individual investigations to determine the influence of the more common chemical elements on the behavior and life of ingot molds are here summarized.

For manganese, the author establishes a "critical manganese content" at about 1.95 per cent manganese. Sulphur tends to affect favorably the ingot surface and is not so harmful as has been contended. Up to 0.15 per cent, the influence of phosphorus is negligible. Nickel additions afford limited economical returns. Additions of chromium above 1.00 per cent give better life, but the extra cost is a consideration.

advocated, though there was limited publicity on the subject. Similar conditions could not exist consistently in other industrial activities and especially not in the various practices of modern steel making.

With these thoughts in mind, the present article represents a summary of a multitude of individual investigations, carried out with the intention of determining the influences of the more common chemical elements upon the behavior and life of ingot mold.

Manufacture and Composition of Ingot Molds

PRACTICALLY all ingot molds of today are produced from one of the following metals:

- A. Gray Iron:
 - 1. Direct blast furnace metal.
 - 2. Mixer metal.
 - 3. Ordinary cupola iron.
 - 4. Ordinary air furnace iron.
 - 5. Alloyed gray iron.
- B. Cast Steel:
 - 1. Acid or basic open-hearth steel.
 - 2. Acid or basic Bessemer steel.

Because of its origin, any of the above mentioned metals contains necessarily one or more known kinds of carbon in addition to silicon, manganese, phosphorus and sulphur besides iron, of course. Occasionally mold metal may contain copper, nickel, chrome, titanium, aluminum and other more or less rare constituents. Oxygen, hydrogen, as well as other gaseous elements or compounds are nearly always present, but their exact influence upon the efficiency of ingot molds has not been studied as yet. Alloying elements, as for example

nickel, chromium, copper, etc., may be present as impurities, the presence of which is unintentional, or else they may represent additions to an ordinary gray iron or cast steel.

Carbon and Silicon

In the past, probably the least attention has been paid to the fact that for the most common material of ingot molds—gray iron—the influence of either carbon or silicon should be judged as a combined effect of both elements. The present tendency of up-to-date foundry practice for the production of satisfactory ingot molds, i.e., to produce iron of better resistance toward deterioration with a most desirable small size of graphite flakes, is governed theoretically by the relationship between the ultimate carbon and silicon contents of the utilized iron.

This relationship was originally expressed by the well known diagram of Maurer. Comparative studies made by the writer on molds of varying carbon and silicon contents revealed the interesting fact that the most durable molds were those whose carbon-silicon point was close to line A-B (Fig. 1). Thus, the chemical specifications for the most efficient mold metals should be determined in accordance with this relationship and with due consideration of the mass effect upon the exact location of line A-B in the diagram.

Molds made of cast steel of basic open-hearth quality showed the longest life at carbon concentrations ranging from 0.32 to 0.40 per cent. The other chemical constitu-



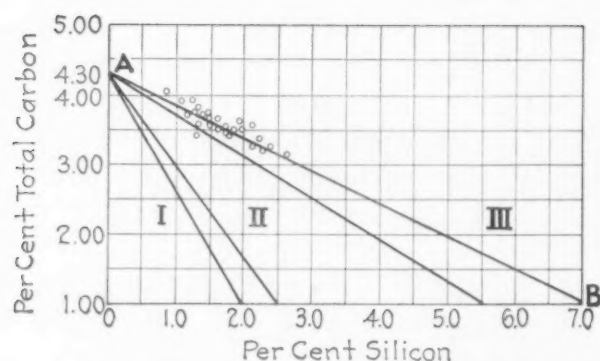


Fig. 1.—Cast iron diagram and life of ingot molds: Field I: White iron (no graphite); Field II: Pearlitic iron (pearlite and graphite); Field III: Ferritic iron (ferrite, pearlite and graphite). Each of the above indicated points represents one ingot mold having a life in excess of 125 heats. Molds made of cupola iron with a manganese content ranging from 0.78 to 1.63 per cent.

ents conforming to good cast steel specifications, the cast steel molds gave satisfactory service for 200 to 260 heats.

Manganese

It is truly remarkable how little influence is generally attributed to the manganese content upon the ultimate life of ingot molds made of gray iron. In order to obtain authentic data upon this disputable point, a comparatively large number of molds was cast so as to contain varying amounts of manganese with all other elements being fairly uniform and the carbon-silicon concentrations being close to the above mentioned relationship.

Several hundreds of these molds were under continuous observation during the entire period of their serviceability. The slightest changes of the interior mold surface were carefully noted and recorded. The obtained values were then computed in accordance with the varying manganese contents and also correlated with the wall thickness and mold size respectively.

From the compiled figures it seems that the manganese affects ordinary molds ranging from about 3½ to 6-in. wall thickness so as to warrant a term like "critical manganese content" at approximately 1.95 per cent Mn. At this concentration the molds gave frequently a serviceability exceeding 180 heats, providing the design of the mold was correct in every detail and the metal represented good cupola iron of a rather fine grain. This life is naturally in drastic comparison with low-manganese iron of 0.34 per cent Mn giving only 46 heats or again iron containing 3.11 per cent Mn with 67 heats respectively. A diagrammatic résumé of the cases under observation is given in Fig. 2.

As an explanatory note to this diagram it may be said that the intermediate cause for final rejection of the molds was governed by the high requirements of the mill in which the tests were conducted. In many instances, the average tonnage mill would have used the rejected molds for perhaps 5 to 20 heats longer, which would have resulted in a still more favorable aspect upon molds containing from 1.50 to 2.40 per cent manganese. The reason for the mentioned critical manganese content for the prevailing ingot conditions is, without doubt, of considerable prac-

tical interest and value. However, it would be far beyond the limits of this report to go into the rather delicate metallurgy of the changes within the mold wall during its life and its correlation with the manganese concentration. A brief outline of how this subject has been dealt with during the course of the above mentioned research work will be found in the author's preliminary report in *THE IRON AGE*, Feb. 21, 1929, pages 539 to 541.

Sulphur

For many decades, the influence of sulphur upon the durability of ingot molds has, for almost unexplainable reasons, been absolutely misinterpreted. Even the most outstanding authorities on the subject seem to have been guided by speculative theories and to have advocated low percentages of sulphur to prevent "undue diffusion of sulphur into the solidifying ingot." A rather simple investigation of the metallographical changes in mold walls before and after the molds are in service would have proved some entirely different reactions of the mold metal and solidifying ingot mass. (See also *THE IRON AGE*, Aug. 6, 1925, pages 345 and 346.)

Sulphur, instead of being ejected from the mold wall into the ingot, is being assimilated by the interior layers of the mold wall presumably in gaseous form (as H_2S perhaps), thus affecting favorably the ingot surface. The steady assimilation of sulphur, however, increases the red-shortness of the ferrous matrix of the mold interior until a point is reached, at which the "fire cracking" or "crow footing" of the surface extends beyond prohibitive limits.

Therefore, desirable prolongation of service life of ingot molds may be accomplished by a low initial

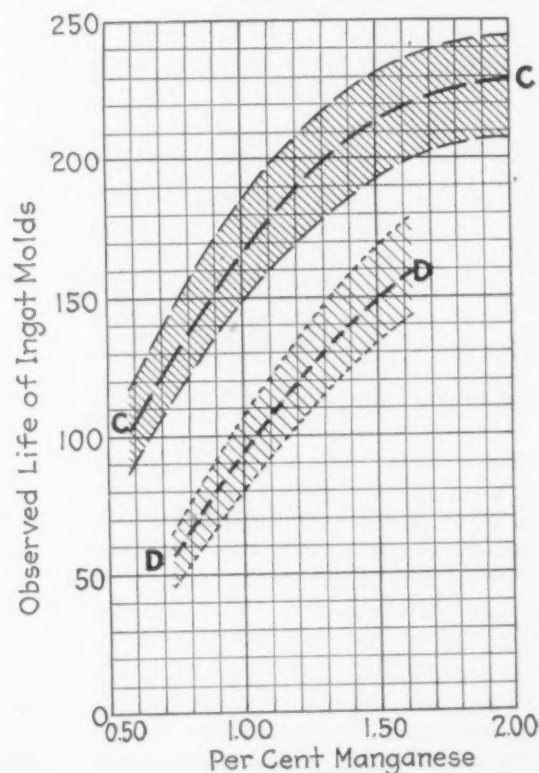


Fig. 2.—Influence of manganese upon ingot mold iron (C-C, cupola iron; D-D, direct blast furnace iron.)

sulphur content, which—in turn—retards the saturation of the mold metal by sulphurous constituents. Effective desulphurization of cupola or even direct metal is, hence, a very remunerative means of producing better and, at the end, cheaper ingot molds.

In order to demonstrate the actual ill effects of high-sulphur iron upon the life of molds, a limited number of molds was intentionally produced from high-sulphur stock and compared with low-sulphur metal made from the identical ladleful of direct metal. The results given in tabular form in Table II are self-explanatory.

Phosphorus

Up to about 0.150 per cent phosphorus, the influence of this element is practically negligible. From a series of tests conducted on various molds used for forging and rolling ingots, it appears that phosphorus changes very slightly during the life of the mold. This change in concentration is always a positive one, i.e., a little of this element is being diffused from the ingot into the surface of the mold. However, this difference was not above 8 per cent of the original amount present. It is interesting to note that this increase was observed in all cases under investigation and that in not even a single instance was there a direct relationship between the concentrations of phosphorus in the mold and the steel teemed into it. The same was true in the case of cast steel ingots of varying phosphorus content in the original mold metal.

Nickel

Experiments relating to the influence of nickel upon the life of ingot molds confirmed, in general, previous findings in other fields, where additions of nickel to gray iron were studied. The effect of nickel in gray iron being chiefly a strengthening of the ferrous matrix and a dissociation of carbides, the economical results of nickel additions to cast iron molds are in an entirely different direction: In ingot making a mold metal is required with a high resistance toward thermo-chemical deterioration, which is a function of crystalline conditions and not directly dependent upon tensile and transverse strength of the ferrous matrix. For these reasons the advisability of nickel additions to mold metals—either gray iron or cast steel—seems to hinge on very limited economical returns.

Chromium

Most of the commercial sizes of modern ingot molds represent castings of heavy sections. Heavy walls, however, account for the practical impossibility to produce uniform grain structure and favorable sizes of graphite flakes. The slow cooling rates of such sections are accompanied by a dissociation of the carbides of iron into graphitic iron and ferrous matter at temperatures exceeding about 1100 deg. F. Since this temperature is frequently reached even during the repeated heating caused by the molten steel, the graphitic flakes are of larger size, especially in used ingot molds. Metallurgically, the combined carbon is very low and the fracture of the casting is coarse, and both phenomena are aug-

mented by low strength and low mechanical hardness.

The tendencies to correct this condition induced the writer (shortly after the war) to add chromium to mold metals. The results were very satisfactory and a brief account of the results obtained was published by the writer a few years ago. At present, the general utilization of chromium additions to mold metals is rather limited, due to the fact that almost ten years after the original tests and after the publication of the advocated analysis a United



Ingot molds ready for teeming.

States patent has been issued to another investigator on the identical subject.

The influence of chromium as a hardening agent may best be realized from a test conducted some time ago. Average analyses and transverse test bars were taken from two ingot molds of 17 in. x 17 in. top section, of which one was made of standard gray iron and the other cast from the same iron but containing, in addition, 0.78 per cent chromium. Both molds were used and into each exactly 100 ingots cast. The comparative figures are given in Table III.

Depending upon local conditions, the economy of chrome additions to gray iron to be used for the manufacture of ingot molds is largely limited to low percentages of the alloying metal. While percentages above 1 per cent Cr give undisputably a better life, the increase in price per pound or ton of the alloyed iron is frequently offset by the cost of plain direct or cupola iron, even if the lower life and other

(Concluded on page 460)

MAGNETIC SEPARATION USED

By J. R. ARMSTRONG

Dings Magnetic Separator Co., Milwaukee, Wis.

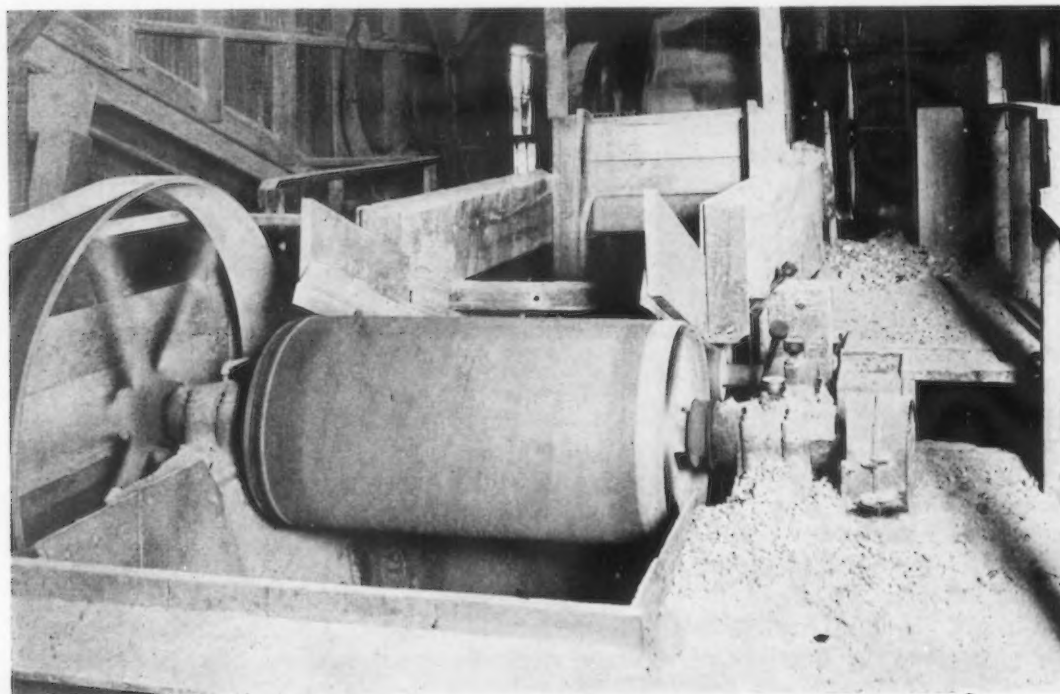
MAKING use of the iron contained in blast furnace slag accomplishes a dual purpose. It conserves natural resources and at the same time renders the remaining portion of the slag acceptable for construction uses. A crushing and magnetic reclamation plant, here described, has been eating away at the slag pile of a large steel company for some years. New slag is fed into the pile about as fast as slag is removed, so that the process is continuous.

UNDER normal conditions, pig iron production in the United States averages around 35 million tons a year. In the typical furnace each ton of pig iron produced results in 0.55 ton of slag. Over a considerable number of years it has been found that blast furnace slag contains from $\frac{1}{2}$ to $1\frac{1}{2}$ per cent iron, by weight. Hence, all of the iron contained in all of the slag would amount to close to 200,000 tons.

The idea of making additional use of slag that has already served one purpose in reducing iron ore to metal is not new, yet even now only a portion of the annual production is processed. When freed from iron the slag has uses similar to any crushed stone and, ordinarily, it has a slightly lower selling price. As it is calcined in burning, and is 100 per cent fireproof, it may even be regarded as superior to the original stone.

Production for the 58 slag-crushing plants in 1929 showed a total slag sales value of \$12,000,000, or an average of more than \$200,000. This sales volume does not include the income from sales of reclaimed iron. On the basis of an estimated average cost of \$150,000 for building a slag-crushing plant, the income from iron alone may frequently pay for the entire operation of the plant.

One plant doing effective iron reclamation



▲ ▲ ▲
SECOND magnetic pulley, 24 x 48 in., at head of main elevator above the screens. This takes out the iron not recovered by the primary unit.
▼ ▼ ▼

FOR RECLAIMING

IRON FROM SLAG

mation is operated by the Illinois Slag & Ballast Co., South Chicago. A low, rugged, dark mountain, entirely incongruous with the level plains around the lower tip of Lake Michigan, is the way the slag pile of the Wisconsin Steel Works impresses the visitor. For years the Illinois Slag & Ballast Co. has been removing great tonnages of this material annually, yet the pile continues of imposing proportions.

Slag Transported in Two Cars Working Alternately

From the slag pile the material is loaded into one of two specially designed automatic, self-tripping dump cars, which alternate in shuttling back and forth to the receiving hopper of the main crushing plant—about a quarter of a mile east of Torrence Avenue, at Ninety-ninth Street. Under this arrangement, one car is always ready for the steam shovel and the supply line can be kept moving continuously. A steam locomotive moves the supply cars.

These cars have a particularly interesting dumping arrangement. By means of a special tripper plate the car is positioned over the receiving hopper and all three drop-doors are released simultaneously. Another spring plate automatically closes the bottoms as the car leaves the plant, making it unnecessary for the engine operator to get out of the cab.

At the receiving hopper the real processing work begins. Despite the fact that crushed slag is generally thought of as a raw product, here it is given as much care and inspection as any special sand or clay used by a potter. It is subjected to as thorough a magnetic separation as materials used by potteries. As a result of the emphasis placed on the control of quality, this company finds it easy to meet the rigid specifications applying to commercial slag ballast.

High standards have repaid the company in several ways. First, a greater percentage of iron can be reclaimed for profitable resale. Second, separation of the iron from the slag reduces the possibility of damage or undue wear occurring in the

crusher. Third, reputation for quality builds up repeat business. And use of dependable and complete mechanical equipment protects both manufacturer and customer from failures in production.

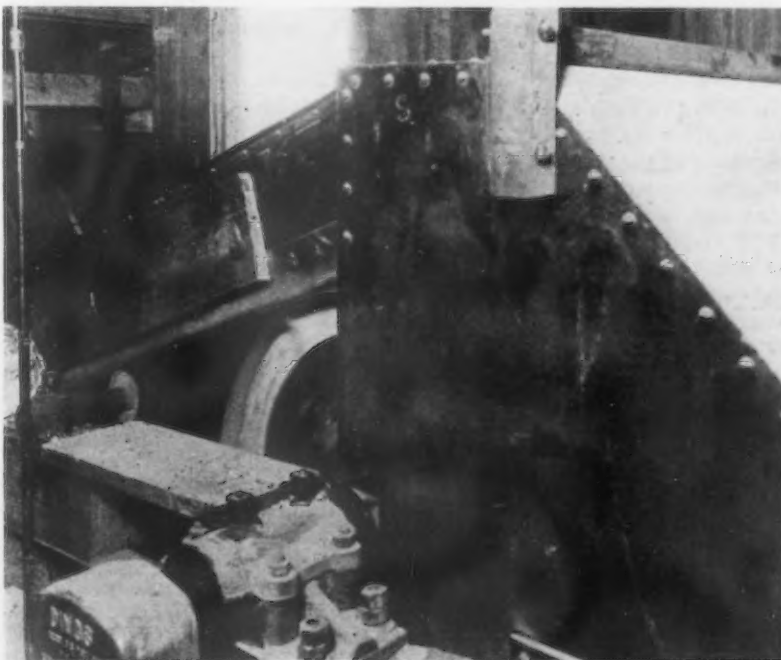
Getting Rid of the Tramp Iron

In the first step of the processing work, the slag is fed down from the receiving hopper by a Webster re-

Dings high-intensity magnetic pulley.

This separator was designed to produce exceptionally high magnetic intensity, which renders it capable of removing not only iron, but pieces of coke impregnated with iron. Due to the light weight of the coke, only a small iron content is required to render it susceptible to this high-intensity magnet.

The slag is then free from all iron



FIRST magnetic separation is done on a high-intensity magnetic pulley, 42 x 48 in., at the head of the receiving conveyor and above the rotary crusher. This removes loose iron pieces and coke containing iron. Only small pieces of iron imbedded in big lumps of slag get by this unit.

ciprocating feeder. As the material passes over the feeder apron an employee manually removes such large pieces of iron as the large skulls that have settled in the bottoms of the ladles. From here the slag drops on to a 36-in. belt conveyor inclined at the unusually high angle of 22 deg. and running between 97 ft. 7 in. centers. The long conveyor discharges to a short 48-in. belt on the third floor of the main crusher house. On this second conveyor is a 42 x 48-in.

except the small pieces entrained in the lumps of slag. From the magnetic pulley the material is discharged directly to a No. 7½ Austin rotary crusher. After crushing, it is carried to the top floor by a No. 8 Austin bucket elevator. Besides reducing the slag to a convenient size, the crushing frees small particles of iron from the center of large pieces of slag, so that it can be removed by a second Dings magnetic separator, size 24 x (Concluded on page 454)



H. A. FITCH

PLACE OF THE INDEPENDENT FABRICATOR*

By H. A. FITCH

President, Kansas City Structural Steel Co.

FOREWORD

WITHIN the past few months the Bethlehem Steel Corporation has purchased or absorbed a number of independent fabricating units which, with its previous fabricating plants, gives to it approximately 30 per cent of the fabricating capacity of the United States.

Prior to this time and at present, it is generally assumed that the American Bridge Co. (a subsidiary of the United States Steel Corporation) represents about 20 per cent of the total fabricating capacity.

Much speculation has been indulged in as to the ultimate destiny of the independent fabricators in the structural steel industry.

It is the purpose of this article to analyze carefully the facts and conditions pertinent to the subject. This analysis will include a brief review of the industry from its beginnings and a study of the relationships as between or among the various elements in the construction business, with a view to determine the economic status of the independent fabricating plants in the general scheme of the building construction industry.

First We Had Bridge Builders

MANY years before the introduction of steel as a commercial building product in the United States, various fabricating units were established at strategic or accidental locations for the promotion, fabrication and building of bridges, such as Union Bridge Co., Athens, N. Y.; King Iron Bridge & Mfg. Co., Cleveland; Wrought Iron Bridge Co., Canton, Ohio; Indiana Bridge Co., Muncie, Ind.; Stupp Brothers Bridge & Iron Co., St. Louis; Clinton Bridge Co., Clinton, Iowa; Wisconsin Bridge Co., Milwaukee; Missouri Valley Bridge & Iron Co., Leavenworth, Kan., and many others. These companies sent their emissaries throughout wide territories, carrying technical and practical information, and blazing the trail for the great steel industry as it exists today.

At the same time there grew up in the various cities and larger towns foundries and iron works applicable to the building trade. These concerns

supplied technical and practical information to the architects, engineers and builders in their respective locations. They "stood by," prepared and equipped, ready to provide the necessary building materials, as and when the builder might need them.

Of such pioneers we recall: Dearborn Foundry Co., Vierlings, Vanderkloots, Chicago; Koken Iron Works, St. Louis; Keystone Iron Works, Kansas City; St. Paul Foundry, St. Paul; Herzog Iron Works, Minneapolis, etc. Thus during the 70's and the 80's were these concerns building up a demand for iron products, which demand augmented the rapid growth of the rolling mill industry.

Local Iron Works Developed Steel Building

Then came the introduction of steel, about 1888. "Standing by" and ready to promote and effect this change from wrought iron and cast iron to steel were these hundreds of institutions with their plants, with their technical knowledge, with their acquaintanceship and their standing in their communities. Within two years

the change from wrought iron to steel had been made; within ten years the cast iron column had given way entirely to the steel column.

The last decade of the past century was the first decade of steel as a building material. Few people have ever realized what effect the introduction of steel at that time has had upon the industrial growth of this nation. The emissaries of the good news of steel rapidly covered the country. From whence went they or came they? Not from the mother church at Pittsburgh; but from the outlying units of independent fabricators at Cleveland, Chicago, Minneapolis, St. Louis, Muncie, Lafayette, Vincennes and Evansville, Ind. Everywhere, the independent fabricators carried the good news of steel to the building industry. The skyscraper was developed in Chicago. From Minneapolis and Milwaukee and not from Pittsburgh went emissaries to introduce structural steel to the mining industry. The Berlin Bridge Co. in Connecticut was a leading factor for steel in the East; the Virginia Bridge Co. in the South, etc. Everywhere the fabricators were carrying the burden of the good news of steel.

By the end of the decade the advance had been so rapid as to bring about complete new alignments in the steel industry. Andrew Carnegie sold out and retired. The United States Steel Corporation and the American Bridge Co. were formed.

And so at the beginning of the present century we entered the second decade of steel.

Beginnings of Centralization

A study of the progress of the American Bridge Co. is very pertinent to our subject. Some twenty or more of the leading bridge and structural plants of the country were merged

*Paper read before a meeting of the Central Fabricators Association at Chicago.

into one. This doubtless represented at that time some 60 per cent or more of the fabricating capacity of the country. (I speak not with a definite knowledge of these facts. It is not essential for our present purpose.) It should be noted in passing that the American Bridge Co. was not organized by or for the United States Steel Corporation. There was for a time some doubt as to its being absorbed by the larger corporation.

Our subject is a study of decentralization versus centralization. In other words, is it more logical for this industry to be handled through centrally controlled, and perhaps centrally located shops, or will best results be obtained by plants being located throughout the country at strategic points under separate and individual control? The argument would be interminable, and yet the problem is more than academic. A proper conception of both phases of the subject would tend to bring about better understandings and perhaps a solution of our vexed problems.

At this point let me interject my own observations and contentions. What I will say is based not upon theory, but upon an experience of over forty years in the structural steel industry. This period, 1890-1931, paralleled almost exactly the period of steel as a commercial product. It has involved the technical, contracting and executive phases of the industry to a full degree in each case. It has included association work and cooperative effort with other fabricators continually and intensively.

Personal Service Element Not to Be Overlooked

And what are the conclusions to be drawn from this four decades of experience? First, and outstanding above all others, is that our business is of the nature of a personal service institution. The success of the company I represent has been not from an advantage in freight rates; not from a purchasing advantage; not from superior plant efficiency or facilities. A review of any of the successful fabricating plants during the past thirty years would indicate their success is based almost entirely on this personal service element.

Let us analyze this still further: The structural steel industry throughout the United States has been built up largely by individual, independent fabricating concerns. The natures of these concerns are individualistic. In nearly all cases they are owned personally by a few persons or are close corporations. The success of all these concerns was made possible through intensive business and technical effort of a few individuals who were financially interested in the successful operation of their respective plants.

In other words, the structural steel business is, to a large extent, a personal service institution. Each structural steel plant in its particular ter-

TERMED a study of decentralization versus centralization, Mr. Fitch's address reviews how bridge builders and then local iron works blazed the trail of the steel building; it discusses the areas of activity as between mill fabricators so-called and the major independent fabricators, and makes these observations about fabricators in general:

The fabricator is primarily not a manufacturing concern.

The fabricator must be located close to customers.

Hit and miss methods of management and the like will no longer prevail.

ritory "stands by," prepared to give service to various customers according to their own specification. The fabricating shop has material available for quick delivery. They have a shop for fabrication as required and a complete technical organization. Most plants have also efficient erection facilities. A fabricating plant is not primarily a manufacturing concern. We serve our customers according to their particular requirements.

The steel fabricating business is a business of infinite detail, demanding concentrated personal attention for each requirement. This situation limits, in a way, the volume of work any one institution can handle. The element of time and continuous personal contact with the customer is a very important factor.

Better Management Now the Word

All the above indicates that in order for the building public to obtain the best results, the fabricating organization should be located close to its customers. It follows from this that the territory covered by a fabricating plant cannot be too extensive to obtain these results.

Thirty-five years ago, and up to twenty-five years ago, the independent fabricator had a very fertile field for promotional work and did a splendid service for the steel industry. And continuing through the years, largely because of this promotional work, steel has come to be recognized as the premier building material. Today, the importance and necessity of the local fabricator as an authority on steel construction is even more necessary than heretofore.

The independent local fabricator of tomorrow must, however, be much more scientific, much better equipped, much better organized, much better managed, than has generally been the case heretofore. We came along with the crowd, on the rising tide of an industry. Now selectivity only will

prevail. Every stroke must count. Hit and miss methods will no longer avail. A loss on every third order will sink the ship. We must know our fabricated steel as we have never known it before.

To return now to our review of the history of the fabricating industry. The American Bridge Co. was formed and in operation in 1900. With the cream of the fabricating plants, it dominated the situation. A few years were required to organize an incongruous group of plants into a smooth working organization. This was accomplished in a reasonably short time. Today the American Bridge Co. is recognized as a premier fabricating organization, efficiently equipped and managed.

The Two Classes of Plants Will Continue

But what happened? Within a few years many of the original plants were closed and their particular locations abandoned. New, larger and more efficient plants were built at the large steel producing centers. The American Bridge Co. became a super-fabricating organization. It became centralized. It abandoned the original idea of covering completely the fabricating requirements of the United States.

And so by selection or natural sequence there has come to be recognized two schools, as it were, in the fabricating industry: The large, high powered centralized plants located at the basing points and thus able to serve large territories in any direction; the smaller and medium decentralized shops, well equipped, but because of their location or other conditions, capable of serving only a limited territory.

And so we have in the fabricating industry two trends: centralization and decentralization. Are they in conflict? Are they balanced? Each method of operation certainly has its important place in the industry. They are not in conflict. Each has its advantages and disadvantages. Both are required to fill the demands of the industry. Therefore both will continue to prevail.

Nevertheless, there is conflict within the industry, a general free-for-all conflict. Ambitiously we formulate our plans; ambitiously we imagine we have an advantage; ambitiously we ruthlessly press our campaign at these imaginary vantage points. A more careful analysis would indicate the fallacy of some of our ideas. Hence this discussion. Let us get our ideas and our aims in balance as nearly as possible.

Each Fabricator Should Recognize His Province

Here is the picture: The two leading rolling mills represent approximately 50 per cent of the fabricating capacity of the United States. (This would appear to be somewhat out of bal-

ance.) They are superfabricators, equipped (and they only are equipped) to handle certain major projects. It must, however, be admitted that no fabricating organization can subsist on major projects only. Nor can the medium decentralized shops subsist on small projects only.

The independent fabricators can be divided into two rather indefinite classes with a nebulous dividing line.

The major plants, fully equipped to handle with high efficiency almost any class of work from 5000 to 10,000 tons, mostly have a range of 1500 to 4000 tons a month. Some few plants have a larger capacity than this.

The minor plants range from about 1000 tons a month down to 100 tons or less. They are very numerous and doubtless very useful to the industry and to the building public in their respective communities; indeed, they are an integral part of and an important factor in their communities.

The problem is for each individual fabricator to study the *range and province* of its particular unit. Of necessity the dividing lines are very indefinite, depending upon personalities, locations, capabilities and previous relationships. Nevertheless, each plant should recognize in a general way its *province*, and whenever it might seem advisable or necessary to go far afield, let it be done ethically and not ruthlessly.

Any attempt at a detailed analysis of this problem here would be out of place. A few general remarks, however, might be in order.

Logically, the first and most important subject for consideration pertains to that wide area of activities lying between the mill fabricating plants and the major independent fabricators.

Program for a Common Understanding

For a period of twenty to thirty years there has existed a most friendly personal acquaintanceship and business relationship among all of the elements now in control of the organizations involved. Our interests are decidedly mutual. Out of the turmoil of competition of the past few years—out of the necessities of the present business conditions—surely some common fundamental understandings as to the *province* of each element can be arrived at.

1. There should be no increases in capacities.

2. Each unit must scale down its activities—much below its potential capacities, in line with the tonnages available in its particular field of operations.

3. The independent fabricators must not encroach unduly upon work which logically would fall within the province of the mill fabricators' activities.

4. The mill fabricators should

take a real interest in, and a helpful attitude toward, the welfare of the independent fabricators, and should not encroach unduly upon the province of the independent fabricators.

5. Every element must recognize that any plant without some reasonable amount of work will of necessity ruin the price structure.

6. Each unit must appreciate the fact that much of the work in each locality has a natural relation to the local fabricator and that this relationship should be recognized and not disturbed.

7. The primary purpose of every fabricating unit should be to realize a profit on every transaction. Overhead expense must be scaled down to suit existent conditions. The fallacious idea of volume to carry an inflated overhead should be discarded.

8. The fact is very apparent that the solution of the problem depends largely upon the interest and the attitude and the helpfulness extended to this industry by the rolling mills.

To return now to the original proposition: the destiny of the independent fabricator. In the decade just past, the annual consumption of structural steel practically doubled any previous annual output. In the decades to follow the requirements for structural steel will continue to grow. Not, of course, in so rapid a percentage of increase.

Independent Fabricator Has Definite Place

The destiny of the independent fabricator as such, with plants located throughout the cities of this nation, is never in doubt. The logic and necessity of this proposition will not admit of any other conclusion. If we who have developed this industry fail in this present emergency, there will be others to follow who will not fail.

The destiny of the individual fabricator in this crisis is in his own hands. The policies and customs that have prevailed heretofore will not in the future suffice to maintain a successful operation. We must know our fabricated steel in a much more definite way than we have known it in the past.

In my mind, as an independent operator, I vision these changes:

Selectivity of inquiries. We will bid on a less percentage of jobs. Our estimates will be more accurate. Our cost analysis more thorough. Eighty per cent of the estimates put out today are slurred over. This practice often tends to disturb the price structure and either gives us a bad job or loses us a good one. The future demands much more scientific estimating and bidding than has prevailed heretofore.

I vision the contracting engineer as something more than a mere salesman (however good a salesman he may

be). He must have a more intimate knowledge of the business element of the industry. He must be responsible for the execution of his orders from the time of the inquiry to the final payment.

I vision a smaller volume of work. Greater efficiency in all departments. Greater profits on our work because of more careful analysis and execution. A much lower percentage of orders with losses. Better collections. Better satisfied customers. A higher self-respect for our own institution and for our industry.

And, finally, in conclusion, I vision an organized industry and the continued regard, respect, consideration and friendship for those men in the industry with whom we have worked these many years.

The American Institute of Steel Construction is the bulwark of our industry. It not only gives us an industry pride, but it supplies us with very necessary technical and general information. It commands the respect of our customers and the public. It gives us an inner consciousness of being a participant in the broader activities of our industry and in a way that could not be realized within the limits of individual operations.

The destiny of the independent fabricator, the destiny of each individual operator—the betterment of conditions in our industry—is today a problem suspended, challenging every individual fabricator, demanding his intelligent and broad-visioned consideration and his active cooperation with the other elements of the industry.

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Industrial Advertising Cost Ratios

Advertising expense averaged 3 per cent of sales in 1931 as compared with 2.32 per cent in 1929, according to reports of 165 concerns in a survey recently completed for the National Industrial Advertising Association. This figure rose to 3.18 per cent in 1930.

Trade paper space accounted for 44.49 per cent of the 1931 publicity budget; direct mail advertising for 12.62 per cent; sales and service literature other than direct mail for 10.86 per cent; artwork, engravings, etc., for advertisements only, 9.63 per cent; administrative expense, including salaries, 9.29 per cent; conventions and exhibits, 3.46 per cent; house organs, 2.85 per cent; price lists and internal publications, 1.28 per cent; motion pictures and photographs, 0.34 per cent; and miscellaneous, 5.18 per cent.

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The manufacturers' section of the American Gas Association, 420 Lexington Avenue, New York, will hold its annual meeting Sept. 17 and 18 at the Book-Cadillac Hotel, Detroit. About 500 gas appliance and equipment makers are expected to attend.

Recording Tensile and Elongation Testing Machine

FOR determining the tensile strength and elongation characteristics of metal sheets and wire, the Amthor Testing Instrument Co., 314 Johnson Street, Brooklyn, N. Y., has brought out a tensile testing machine that permits comparison of complete and exact test evaluations on a graphic chart.

The instrument is of the pendulum type; a 1/16-hp. motor furnishes the pulling force on the test specimen which is connected at its upper end to the pendulum or indicating arm. This arm is held at the exact breaking point of the specimen by means of pawls, thus indicating the tensile strength on the pointer scale as well as permanently recording it on the graphic chart. Scales of two separate capacity ranges, one having approximately one-fifth of the capacity of the other, are provided. The scale with the smaller range is finely sub-

termination of physical characteristics as possible with this type of test. The chart not only records the exact tensile strength, but also the elongation and proportion of elongation to the increasing load throughout the entire test from the first application of load, through the yield point, to the moment of rupture. Quadrilateral subdivisions of the chart facilitate accurate reading. An elongation scale may be furnished instead of the recording unit if desired.

Load is applied to the pulling clamp through a variable speed control unit that permits speeds to be varied to suit the characteristics of the metal being tested. This mechanism is inclosed in a dust-proof metal housing. The instrument is about 36 in. high and is of compact design.

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Krag Sine Angle Plate

BY means of the Krag Sine Angle Plate it is said to be possible to determine the exact angle or to produce an angle of any degree or fraction within one or only a few minutes. This angle plate employs a combination of the two most accurate methods of measuring an angle known, the sine and the gage block. The device is made by Franz K. Krag, 319 North Albany Avenue, Chicago.

Krag sine angle plates consist of two elements hinged together and so arranged that the one may be clamped at any angle between 0 and 45 deg. with respect to the other. The bottom element is provided with an accurately ground, hardened and lapped anvil; the upper element with a ground, hardened and lapped cylindrical surface.

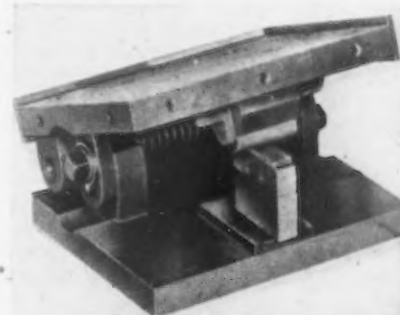
These two elements constitute the working surfaces between which the precision blocks are placed; the space between them comprises the sine of the angle. The distance between the center of the shaft and the center of the cylindrical face is exactly 3 in. When using precision blocks, any angle can be obtained within 1/10,000 in. in 3 in. This, of course, is a greater precision than ever attained or attempted by any angle plate.

No surface plate or height gage is required for setting up. When the proper blocks are used the sine of the angle is accurately indicated within the limits of accuracy of the blocks. Usual sources of error as well as the inherent causes of delay and expense are eliminated, it is stated.

It is a simple matter to determine or obtain any angle. To obtain any given angle, the two clamping screws holding the two plates in position are loosened by a socket head wrench.

The precision blocks corresponding to the sine of the required angle are placed between anvil and cylinder, and the movable element locked in position.

To find the equivalent angle, the space between anvil and cylinder is measured with the precision blocks, and the length or dimension is then



Krag sine angle plate, showing precision blocks in use between gage surfaces.

compared with the sine table. The angle, in degrees and fraction of a minute to five decimal places, can then be found from the sine table.

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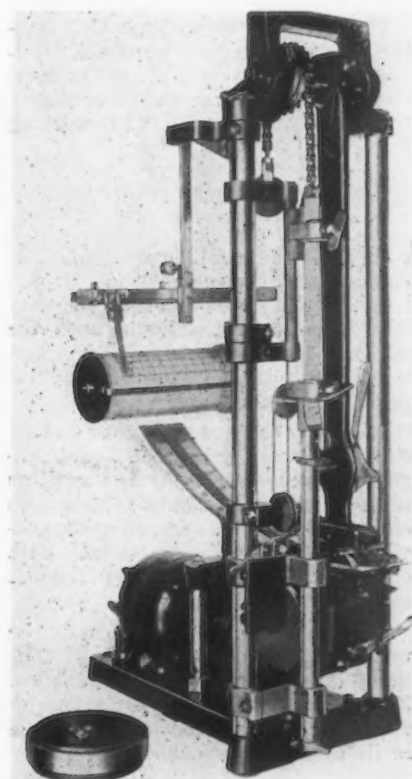
Indicating Wire Gage

THE wire gage illustrated, recently added to the line of the Federal Products Corp., Providence, R. I., is designed for checking wire ranging up to 0.2 in. The dial is graduated in 0.001 in.

The indicator is inclosed in a dust-proof auxiliary housing, and the anvils, furnished to sizes specified, are interchangeable. The adjusting



screw provides instant setting to any size, and a safety rocker arm is attached for holding the anvils out of contact. A compensating weight provides for tension adjustment. Guide rollers are optional equipment. The gage is designated as Model No. 493.



Curves showing the elongation characteristics are automatically traced by a pen attached to the pendulum of this tensile tester.

divided for accuracy in testing specimens of low breaking strength.

The recording unit, usually furnished with the instrument, is designed for holding the graphic chart. Curves produced on this chart during a test or series of tests are used in conjunction with the indicator scale readings to obtain as complete a de-

Furnace Meter Indicates Combustion Efficiency

FOR use as a combustion guide in the firing of gas or oil heaters, kilns, and all types of industrial furnaces, the Bailey Meter Co., Cleveland, is offering the ratio meter illustrated. This instrument was developed to enable furnace operators to maintain a definite relation between the amounts of air and fuel supplied to the furnace, and thus to obtain high combustion efficiency.

The meter contains two recording pens. One records the rate of oil flow and is actuated by a simple mechanism which receives its motive power from the differential pressure produced



The flow of the fuel and the air to the furnace is recorded on the dial chart of this meter.

by an orifice in the fuel line. In similar manner, the shorter pen records the flow of air to the furnace. At the time the meter is being installed, a complete combustion test is run on the furnace to determine what ratio between air flow and fuel flow corresponds to best combustion conditions; the air-flow mechanism is then adjusted so that this ratio is always obtained when the two records coincide, one upon the other. The furnace operator, therefore, merely has to keep the two pens together by proper manipulation of the air supply, to be assured that maximum economy is being secured.

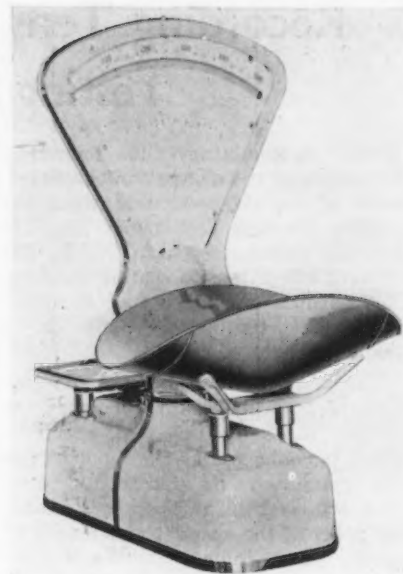
Should the air-flow pen be above the fuel-flow pen it is an indication that too much air is being supplied, with a consequent increase of stack losses. Conversely, should the air-flow pen be below the oil-flow pen, it is an indication that too little air is being supplied, with consequent loss due to unburned fuel.

The ratio meter is useful also as a fluid meter on the fuel line. It records and indicates the rate of flow in any convenient terms, and the total flow may be given by the four-dial integrator, which may or may not be installed in the meter as desired. Auxiliary temperature or pressure recorders may be installed to give records of these factors on the same chart with the flow records. Each factor is recorded in an individual color on the 12-in. diameter chart.

Scale for Use in Industrial Research Laboratories

A LABORATORY scale designed to permit close reading without the use of extended beam equipment has been placed on the market by the Toledo Scale Co., Toledo, Ohio. It is said to make possible the weighing of ingredients accurately, to the gram, in approximately one-quarter the time consumed with balance equipment. The oscillation usually found in extended beam scales is said to be eliminated.

The chart on this scale has a range of 500 grams, with a mark and figure for each gram. It also shows the avoirdupois equivalents. Additional capacity up to 5 kg. may be secured



by the use of weights. The chart housing may be set at any convenient angle. The scale is finished on baked gray enamel and may be equipped with either a pan, platter or scoop.

Pennsylvania Wire Glass Co., Dunbar, Pa., has resumed production following a shut-down for four months, and plans to increase output soon to a three-shift basis with full working force.

Electro-Viscometer for Industrial Liquids

AN instantaneous electric viscometer for rapid measurement of the viscosity of finishing materials has been developed by the DeVilbiss Co., Toledo, Ohio. This device indicates viscosity of paints, varnishes, lacquers, oils, etc., in visual scale units. To avoid faulty spray jobs, poor atomization, orange peel, dusty work, sags, etc., due to inaccurate thinning or viscosity control, the DeVilbiss electric viscometer measures the viscosity of finishing materials in the plant to an accuracy of within 2 per cent.

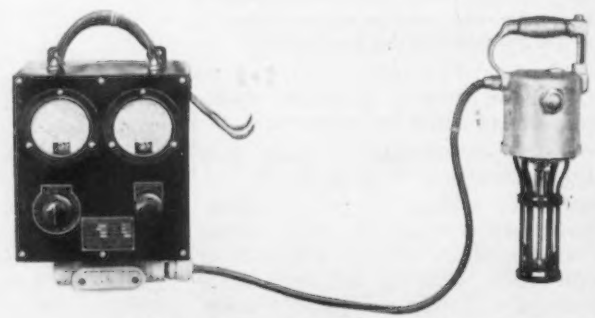
Viscosity is measured by rotating an impeller immersed in the liquid under

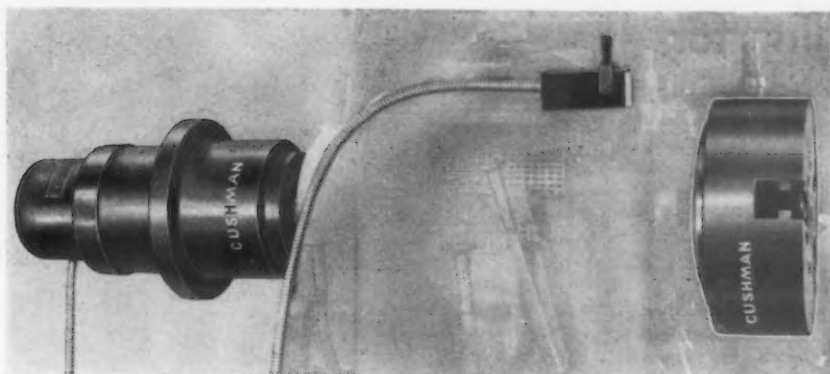
standard electrical conditions. It shows liquid consistency as a dial reading. The effect of the viscosity load imposed by the liquid upon the impeller is determined by the effect upon the electrical circuit of the rotor driving the impeller.

The scale has been designed so that the units vary for a given liquid density approximately with the logarithm of the absolute viscosity. Calibration charts are built up permitting the converting of DeVilbiss units into such other established units as Saybolt seconds or Engler degrees.

All measurements can easily be made in the original container. The liquid does not need to be transferred into the instrument. Instead the instrument is introduced into the liquid in its original receptacle.

IMMERSION impeller at right records viscosity on the dials through the electrical load on the motor driving the impeller.





Electrically-Actuated Chuck Operates Rapidly and at Low Cost

RAPID operation, ample gripping pressure, positive locking during the machining cycle, and low power cost are features of the Cushman electrically-operated self-centering chuck which is being placed on the market by the Cushman Chuck Co., Hartford, Conn.

The chuck is operated by a motor with gear reduction unit and is self-contained. Made in seven sizes, from 8 to 24 in., two or three jaw, it is offered for use on engine and turret lathes in place of air-operated and hydraulic chucking equipment.

Only 1½ sec. is consumed in making the full 1-in. movement of the jaws provided in this design. It is stated that on a test job, a 15-in. three-jaw chuck of this design was found to exert gripping pressure in excess of 10 tons, and that the power used in 900 chuckings was only 1 kw.-hr. Flexibility of gripping pressure is obtained through rheostat controlled resistance, which permits pressure variations ranging from maximum to 50 per cent in six stages. When only one gripping pressure is required, provision can be made accordingly. Positive locking of the jaws is accomplished without the aid of machine on which the chuck is used, and electric power is used only during the gripping and releasing of the work. The entire mechanism is "chip proof."

The equipment comprises two complete units, the chuck and the motor, connected by a draw-bar of suitable length. There is also a control box containing reversing switches, and, when desired, a rheostat through which the draw-bar pull may be regulated by means of resistance to give the jaw pressure desired. This box may be mounted on the wall, the machine or elsewhere, as convenient.

Opening and closing of the chuck jaws is accomplished by a lever switch, which, located at the operating position, provides finger-tip control. Movement of the lever in one direction causes the jaws to grip the work, while movement in the reverse direction releases the work. Upon re-

lease of the handle after either movement, the lever returns to neutral automatically.

The typical chuck of this design, such as shown in the illustration, is furnished with a 1-hp. 1750-r.p.m. motor, which, at the instant of maximum pressure is said to develop momentarily 3½ hp. The motor is bolted to a gear reduction, which, in turn, is attached and locked to the machine spindle, the entire unit revolving with the spindle. Power contact with the mo-

Small Centrifugal Pump and Motor Unit

TO provide an efficient unit of simple construction, the Worthington Pump & Machinery Corp., Harrison, N. J., is offering a series of centrifugal pumps, designated as the "Monobloc," type D. The pump is bolted directly to the extended frame of its driving motor, the bronze impeller being mounted on the end of the motor shaft.

The bronze shaft-sleeve is cast integral with the impeller. Other important features include a cadmium-plated steel locking device for the impeller, a forged bronze packing gland, and special water-thrusters on the shaft to prevent leakage into the motor bearing. Standard electrical construction is incorporated in the ball-



tor is provided by three collector rings and contact brushes at the rear end of the motor. The drive from the motor shaft is through hardened chrome-nickel steel gearing and a nut, which, in rotating, causes a screw to move backward or forward and actuates the draw-bar accordingly. The motor comes to full speed before picking up the load, this being accomplished by a special abutment arrangement for which patents have been applied. In reversing the armature, the motor is at full speed and delivers a hammer blow to the nut, causing it to release.

The body of the chuck is of steel and is amply reinforced to prevent distortion. The jaws, jaw levers and most of the other parts are made of chrome-nickel steel, heat treated. In form, the jaws conform to the proposed National standard. Careful attention to strong and durable construction is reflected in the following features of the chuck mechanism: Jaw levers which fulcrum on pins made integral with them; renewable hardened tool steel bushings; jaw lever and centerplug pins that are self-adjusting with the lever action and are rigidly and accurately centered; centerplug with wide bearing to provide adequate support in the body and proper alignment; hardened tool steel pilot bushing ground in position; and a pilot sleeve providing a depth of 12 in. in the standard chuck.

bearing Masterbuilt motors that have been designed especially for this service.

Applications suggested include assembly in air conditioning apparatus, washing machinery and similar built-in installations; also service on sprinkler systems and for other industrial purposes. Capacities range from 10 to 150 gal. per min., and heads from 15 to 115 ft. Motor capacities from ¼ to 5-hp. and speeds of 1725 and 3425 r.p.m. are obtainable.

Alloy Steel Wire Screens for Rough Service

FOR revolving screen jackets, vibrating screen sections and other rough, abrasive applications, the Ludlow-Saylor Wire Co. St. Louis, is now offering a complete line of its alloy steel coarse-mesh woven wire screens.

These screens, bearing the trade name of "Spring-Steel," are available in approximately 250 grades and meshes, with openings ranging from 4 in. down to 1/16 in. The former are made from heavy "Spring-Steel" bars and the latter from No. 20 wire of the same material. Unusual length of life, saving time consumed in frequent changes, and enduring accuracy of weave are features emphasized.

Car-Loading Machine for Heavy Materials

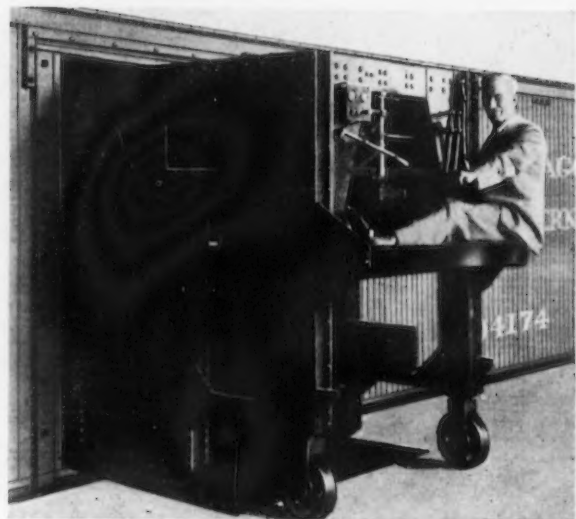
A **LOADING** machine designed to lift and carry bundles of sheet metals in and out of box cars at a minimum expenditure of time and labor has been developed by Signode Steel Strapping Co., 2600 North Western Avenue, Chicago. Though large appearing and powerful, it is ingeniously constructed so that it will easily enter a box car and pick up or deposit a load of sheets in the space desired.

It is said to load or unload a box car under ordinary operating conditions at a cost of not over 2c. a ton. A 40-ton car can be loaded or unloaded by one man with this equipment in less than 30 min. Two 20-in. bundles of sheets, one on top of the other, may be handled at one time.

All operations and movements are easily handled by one average workman. He does not leave his seat to load, hoist, travel forward or backward, enter or leave a freight car, or any other necessary operation. No extra crane or other equipment of any kind is needed.

The bundles are first tightly strapped to simple skids with the Signode tensional steel strapping system and are then ready to be handled. This method not only eliminates slow and expensive handling, but also precludes the possibility of damage caused by handling the material, sheet by sheet, to and from the car.

▲ ▲ ▲
CATERPILLAR treads carry most of the weight of this car loader, which has 10-ton capacity. It may be run into a car and turned, to place the load where wanted.
▼ ▼ ▼



This Edwards loading machine is a gasoline-powered trackless crane, fabricated from heavy structural steel, which straddles the loads. It is remarkably strong and flexible, yet of simple design, with few parts to get out of order. The hoist has a generous factor of safety and the front wheels are broad tractors that amply spread the weight for all average types of flooring, both in plants and freight cars.

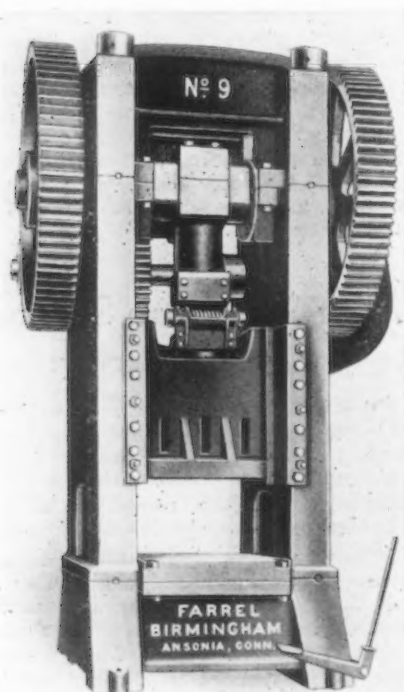
As the power unit is mounted at the top, the space between the legs is clear to provide a 44-in. lift for the 10-ton hoist.

Two-thirds of the weight is carried on two caterpillar treads providing 144 sq. in. of bearing surface. These treads are manufactured from links of special steel alloy. The other end of

the machine is carried on wheels of ample size and face. The steering bar varies the relative speed of the two caterpillar treads and also steers the wheels, allowing practically right-angle turning.

A four-cylinder Continental gasoline motor drives the caterpillar tread through Cletrac transmission. It also provides the power for the hoisting mechanism and for clamping the carrier hooks under the bundle.

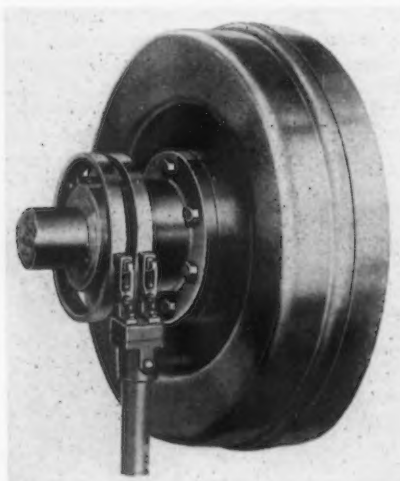
The machine itself is 4 ft. 5½ in. wide by 5 ft. 9¼ in. long (plus 22 in. for guard and seat) and is 7 ft. 2 in. high. The carriers are 8 ft. long and extend about 27 in. beyond the frame of the machine. The caterpillar treads eliminate breaking car floors and permit running over ordinary holes or splintered boards.



Push-button control is provided by the magnetic clutch shown in the close-up at right.

Welded Steel Frame Power Presses with Magnetic Clutch

IMPROVEMENTS recently announced in the design of power presses built by the Farrel-Birmingham Co., Ansonia, Conn., are intended



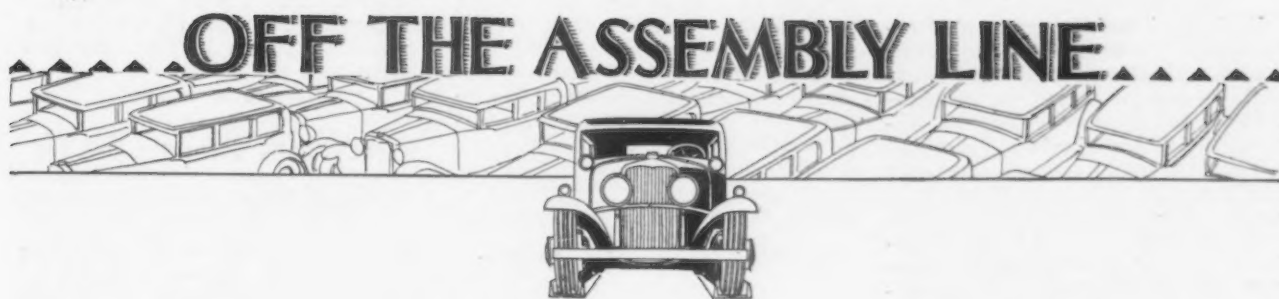
to provide greater safety in operation, increased production capacity and less operating and maintenance cost. Welded steel frame construction is employed.

Anti-friction bearings are now standard equipment on the driveshaft of all geared presses. Wherever possible anti-friction bearings are placed on each side of the main pinions.

A multiple-disk friction clutch with magnetic control and brake permits push-button control with much less exertion on the part of the operator than required by the mechanical clutch formerly employed. Start and stop buttons may be furnished for one or more operators at various points about the press.

Continuous operation, single strokes and inching operations are provided by suitable controls. A positive stop on the up-stroke makes repeating impossible except when the proper button has been pushed for continuous operation.

A rheostat in series with the magnet may be used to control the clutch to a given horsepower; this feature provides direct protection against breakage due to overloading.



Automobile Production Expected to Turn Upward in September

DETROIT, Aug. 10.

LATEST reports for July indicate that automobile output was about 221,000 units, which was somewhat more than the industry had expected. Moreover, there are signs that August assemblies may run as high as 175,000 cars, with everyone agreed that production, which began to decline in May, will turn upward in September. The extent of the recovery next month rests principally on the plans of the Ford Motor Co.

So many conflicting statements have been made about the present status and the future program at the Rouge plant of the Ford company that one scarcely knows what to believe. It can be said, however, that the situation resembles in many respects that in the days immediately preceding the introduction of model A in 1927. An air of mystery has been thrown around activities at Dearborn for the purpose of keeping secret as long as possible Mr. Ford's plans for the future. Plymouth as well as Chevrolet is now challenging the Ford leadership and the industry's eyes are on Dearborn, eager to find out what Mr. Ford is going to do about it.

Despite the fact that the Rouge works is supposed to be closed at this time for vacation and inventory purposes, there are today between 45,000 and 50,000 men actively employed there, exclusive of the final assembly department. In addition, there are at least 20,000 men at work in branch assembly plants, so that the Ford company is carrying on with about 65,000 men during what has been termed a "shutdown." In addition to the cars turned out in branch assembly plants during August and September, it is understood that the manufacturing divisions at Rouge will make parts for about 100,000 cars before

Aside from Fords assembled at branch assembly plants this month and next, manufacturing divisions at Rouge will produce parts for 100,000 cars before end of September.

* * *

Ford has 45,000 men actively engaged at Rouge. With 20,000 at work in branch assembly plants, this makes a total of 65,000 men who are carrying on during the so-called "shut-down."

* * *

Plymouth has schedule of 27,000 cars this month. Nash and Willys-Overland have joined free wheeling group.

* * *

Ford dealers sold 350,000 passenger cars and Chevrolet 368,000 in first six months of 1931. Buick was third with 54,000 cars and Pontiac fourth with 47,000 units.

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the end of September. Just when all manufacturing departments will be in production again is uncertain, although they cannot be down more than a few weeks if this schedule is to be met. No indication has been given as to when Ford will resume taking steel, but steel sales executives are hopeful that purchases will be made the latter part of August.

Chevrolet and Plymouth Operating at Fairly Good Rates

Chevrolet turned out 66,000 cars in July and will make 50,000 to 55,000 this month. It is expected to have a

fairly good schedule in September, although it may begin to taper in anticipation of 1932 models. If last year's program is adhered to, the Chevrolet foundry at Saginaw will be closed the latter part of September and manufacturing divisions will be tooling up for the new line in October, with the factories swung well into output of new cars by November.

Plymouth is said to have a schedule of 27,000 cars this month, or about 1000 cars a day six days a week. It is not known whether this high rate will be maintained in September. There have been intimations that it may fall off slightly. Nevertheless, Plymouth and Chevrolet are the only two companies which are taking any sizable tonnages of steel; if their shipments were subtracted from the total, the volume would almost approach the vanishing point. Other companies have altered their activities little in the past week. Oakland-Pontiac, Cadillac - LaSalle, Reo, Graham-Paige and Oldsmobile continue closed.

Retail sales have shown the usual seasonal recession. Perhaps the appearance of the new Plymouth prevented them from sinking to lower levels, as Chrysler, DeSoto and Dodge dealers handling the Plymouth were spurred on to extraordinary efforts, and competitors naturally exerted extra energy to offset the newcomer. Incidentally, many automobile executives declare privately that the Plymouth merchandising campaign is the best the industry has seen in several years. New passenger car registrations for the first six months of 1931 show that Chevrolet titled over 368,000 cars and Ford 350,000. Buick has a clear claim to third place, with 54,000 cars, while Pontiac is in fourth position, with 47,000 units. Both

Chevrolet and Ford sold more cars in New York than in any other State.

Nash Adopts Free Wheeling

Nash has joined the group of "free-wheelers," having added free wheeling as optional equipment on its new line. It calls this feature "synchronizing-safety" free wheeling as opposed to the "selective" and "positive" and other types of free wheeling now on the market. The car is thrown in or out of free wheeling by a clutch at the driver's side. The free wheeling consists of an over-rolling or one-way clutch mechanism, which transmits power while being rotated in one direction, but rolls free when its direction is reversed. It is of the advanced roller type. First introduced on its low-priced model 95 Willys-Knight, the Willys-Overland Co. has extended free wheeling to all of its models as optional equipment. This unit likewise is controlled by a lever conveniently located for the driver.

It is considered in Detroit that aside from General Motors, Hudson and Studebaker, manufacturers have generally disregarded the request of the National Automobile Chamber of Commerce that new models be introduced only at the turn of the year. In the past few months there has been a deluge of new cars. Some explain the situation by saying that there was a misunderstanding on the part of makers who subscribed to the plan, some believing that it was not to go into effect until 1932.

Experiments with Rustless Steel

One of the large wheel companies is reported to have made recently a number of artillery type wheels of rustless steel for Pierce-Arrow. These wheels are produced from two stampings welded together. Some experiments have been conducted in manufacturing wheels from so-called "composite steel," consisting of an outer layer of rustless steel with the inner content standard carbon steel. This is still in the experimental stages. "Composite steel" is being furnished by two steel mills, one in the Pittsburgh district and another in southwestern Indiana. It is not likely that changes in model A Ford will affect the amount of rustless steel used per car.

The new Plymouth has only two minor parts for which rustless steel is specified, so that the rustless steel people are not getting much satisfaction out of this showing. They are still pinning their hopes on being able to persuade low-priced car makers to follow Ford's example of using their material for the radiator shell, but their chances of gaining much headway on 1932 models, when manufacturing economies will be stressed more than ever before, appear slim. Two automobile companies have displayed special jobs having wire wheels with the spokes made of rustless steel, but the extra cost of \$150 for this feature is virtually prohibitive. The Alle-

gheny Steel Co. now has on tour a two-door Ford car with all parts usually made of steel sheets constructed of Allegheny metal. It has a satin-colored natural finish without paint, but the top is painted red. It is being displayed in Detroit at present and shortly will move on to other cities for publicity purposes. The Ford company is reported to have assembled two of these cars, selling one to Allegheny and the other to a second manufacturer of rustless steel.

Duralumin as Car Material May Spring Into Favor

An automobile company outside of Detroit is experimenting on a car, with many parts made of duralumin. If these experiments prove as successful as present reports indicate, there is a strong possibility that a line of 12 and 16-cylinder cars will be introduced at the end of the year. Marmon has an aluminum engine in its 16-cylinder models and Fageol has a truck with aluminum body and some other parts made of aluminum or aluminum alloys, but this is the first case where duralumin has been seriously mentioned as a major material for automobile construction. The industry is watching this experiment with much interest.

Several motor car makers have commented recently on the increased popularity of radios as extra equipment for automobiles. Studebaker has devoted considerable attention to the radio feature, building radio aerials into the roof of its closed models with lead-in wire carried in through the front roof pillar. Automobile radio has been impractical until recently due to the fact that the automobile ignition system caused severe electrical interference. Studebaker engineers have overcome this handicap by fitting all electrical units, such as the generator, distributor and spark plugs, with "suppressors," which subdue static disturbances and result in constant clear reception irrespective of direction or speed. All wires as well as the aerial are thoroughly insulated from the body.

Graham-Paige is pioneering in the industry by putting into effect a plan whereby it will participate with its dealers in paying the latter's salesmen their salaries plus commission. It is the first attempt to put motor car salesmen on a regular income basis throughout a factory's dealer organization.

General Motors Ahead of Last Year July Sales

July sales of General Motors cars to consumers in the United States totaled 85,054, against 80,147 for the corresponding month a year ago.

July sales of General Motors cars to dealers in the United States totaled 78,723, against 70,716 for the same month last year.

July sales of General Motors cars to dealers in the United States and

Canada, together with shipments overseas, totaled 87,449, as against 79,976 for the same month last year. This represents the fourth consecutive increase in total sales over the corresponding month of the year previous.

Chevrolet Plans Detroit School for Apprentices

Plans for the building and operation of a Chevrolet apprentice school of mechanical craftsmanship have been announced by W. S. Knudsen, president and general manager of the Chevrolet Motor Co.

The school building, which will provide approximately 10,000 sq. ft. of floor space, will be erected adjacent to the Chevrolet Detroit gear and axle plant. Work on the proposed building will be started in the near future.

When completed the school will be equipped with every type of machine necessary to all the finer mechanical arts and crafts, and the work will be directed by C. E. Wetherald, general manufacturing manager of Chevrolet.

The Chevrolet course will be an exact duplicate of the school operated by Chevrolet in Flint. While preference will be given to sons of Chevrolet employees, all boys who are mechanically inclined, between the ages of 16 and 18 years, will be eligible to enter the Chevrolet school. The normal course will occupy four years and the class will be limited to 50 boys.

"However," said Mr. Knudsen, "there will be no hard and fast rules governing the length of time the apprentices will be required to attend the school. Experience has shown that some boys progress much faster than others and these gifted youngsters will be advanced as rapidly as their work justifies."

During the first three months all apprentices entering the school will be placed on probation; if their work justifies the interest shown in them, they will be carried on until they are graduated as skilled craftsmen. While attending the school the apprentices will be carried on the payrolls under a graduated pay scale. Upon completion of the course the graduates will be assigned to skilled work in one of the 53 Chevrolet plants located in various parts of the country. The course as outlined by Mr. Wetherald includes instruction in tool-making, die-making, pattern-making and general machine shop practice.

Bruce & Cook, Inc., 373 Pearl Street, New York, has been appointed agent for portable electric tools made by the Stanley Electric Tool Co., New Britain, Conn. A stock will be carried of electric hammers, wood and stone saws, motor-driven shears, electric drills and screw drivers, bench and aerial grinders.

Nearly All Steel Companies Have Now Reduced Salaries

United States Steel Corp. One of the Last to Resort to This Economy—Five-Day Week Widely Adopted

WITH the putting into effect on Aug. 15 of a reduction in salaries by the United States Steel Corp., practically all of the steel companies have adjusted downward the payments to office and executive workers, though few of the steel companies have cut basic wage rates.

The cut in salaries of United States Steel Corp. employees, which was authorized at the recent meeting of the board of directors, amounts to 10 per cent on all whose salaries range from \$1,800 to \$5,000 a year; 12½ per cent on those from \$5,000 to \$10,000, and 15 per cent on those above \$10,000.

The Republic Steel Corp. has made official announcement of a cut of 16½ per cent, which went into effect July 1. The Youngstown Sheet & Tube Co. cut salaries 20 per cent on July 1.

Five-Day Week Generally in Effect

In some instances the cuts in salaries have been put into effect through the adoption of a five-day week. A plan of "staggering" working hours was adopted recently by the Bethlehem Steel Corp., but the actual reduction for all office and executive employees amounts to about 20 per cent.

The Jones & Laughlin Steel Corp. adopted a five-day week and a 16½ per cent salary reduction as of May 1. The Pittsburgh Steel Co. placed all salary workers on a five-day week on Feb. 1, but reduced salaries only 14 per cent.

The first public intimation of a cut of salaries by the Crucible Steel Co. of America was given in the recent report to stockholders by H. S. Wilkinson, chairman, who said that a reduction of 20 per cent was put into effect last January.

The Inland Steel Co. has gone on a five-day week, with salaries at five-sixths of what they formerly were. Salaried employees making \$100 or less a month were exempted. This company also realigned the vacation schedule, giving preference to employees with the longest record of service. The Calumet Steel Co., Chicago Heights, Ill., cut salaries 10 per cent as of Aug. 1. A salary cut of 10 per cent has been in effect since last December among employees of the Acme Steel Co., Chicago.

Although the larger steel companies have made no adjustments in wage rates, some of the smaller companies have done so. The Corrigan, McKinney Steel Co., Cleveland, reduced its basic wage scale from 55c.

to 50c. per hr. on March 1, and at the same time cut salaries 10 per cent. Employees of the Empire Steel Corp., Mansfield, Ohio, now in receivership, accepted a 5 per cent cut voluntarily. The Lukens Steel Co., Coatesville, Pa., some time ago cut salaries and wages 20 per cent, and the Central Iron & Steel Co., Harrisburg, Pa., likewise reduced all employees 15 per cent.

The National Steel Corp. has not made any changes in salaries, nor has the Otis Steel Co., Cleveland, although the latter company may do so soon.

National Steel Completes \$36,500,000 Program

The National Steel Corp. completed its \$36,500,000 rebuilding and expansion program recently, when the last unit of its new Great Lakes Steel Corp. plant at Detroit, a 10-in. merchant bar mill, was successfully started up.

The program was begun in 1929 and included, besides the construction of a \$29,000,000 completely integrated steel manufacturing and finishing plant at Detroit, the purchase of 800 acres of Lake front land in the Chicago district for a future plant site and the enlarging of the Weirton Steel Co. plant at Weirton, W. Va., to secure further diversification of products. In addition, the company also acquired the sheet finishing plant of Michigan Steel Corp. at Detroit.

Scale Car for Charging Blast Furnaces

New features are incorporated in a new McKee double-compartment 25-ton capacity scale car brought out by Arthur C. McKee & Co., Cleveland, for use in charging blast furnaces. The car is of welded construction, which has decreased weight and increased stiffness, rigidity and stability.

The scales, developed in the laboratories of the Toledo Scale Co., have all welded lever construction. The scale dial and recorder is 28 in. in diameter at the reading line and 34½ in. outside. Markers for charge increments are attached to the outside of the glass case, making it unnecessary to open the case while weighing.

The mechanism of the recorder affords a new convenience. By means

of the tape printing type, an original and carbon copy of the recorder of each increment charge is supplied the superintendent's office and accounting department. The scale has an attachment which prints opposite each weighing record the kind of material weighed, thus keeping an accurate record of the proper weight of each material and the sequence of charging.

Other features of the scale car include trucks of arch bar or cast steel construction built to American Railroad Association standards, air-operated brakes with ample size compressor and storage tanks and hopper doors operated by air.

Engineers Form Machine Design Committee

A committee on machine design has been appointed by F. C. Spencer, Western Electric Co., Kearny, N. J., chairman of the machine shop practice division of the American Society of Mechanical Engineers. This committee will arrange for machine design papers for meetings of the society, and will, in general, coordinate activities relating to this phase of engineering and manufacturing.

Members of the committee include: F. L. Eidmann, chairman, professor of mechanical engineering, Columbia University; J. B. Armitage, chief engineer Kearney & Trecker Corp.; G. H. Ashman, engineer General Electric Co.; G. F. Cosgrove, president Cosgrove Technical Service; Frederick Franz, consulting engineer; and Albert Palmer, assistant to general manager Crompton & Knowles Loom Works.

Two British Societies Announce Meetings

Arrangements have been made for holding the autumn meeting of the Iron and Steel Institute at Swansea, Wales, Sept. 29 to Oct. 2.

The autumn meeting of the Institute of Metals is to be held in Zurich, Switzerland, Sept. 13 to 18, following the first congress of the New International Association for Testing Materials.

Ford Motor Co., Dearborn, Mich., has completed branch assembling plant on 72-acre tract at Richmond, Cal., designed to furnish Ford cars on Pacific Coast and to Hawaiian Islands, Guam, Tahiti and other points in Far East. Main unit is 320 x 960 ft., with second story, 160 x 960 ft., and will have rated output of 400 cars daily. It represents investment of close to \$5,000,000. Operations will begin soon with working force of about 1000 men and which will be stepped up to full quota of 2600 operatives.

Reinforcing Steel

Awards at Low Point—Inquiries in Fair Volume

LETTINGS of reinforcing steel the past week were the lowest since the week of Jan. 1, totaling only 1330 tons. The largest booking was 500 tons for State roads in Massachusetts. New projects are the largest since the week of May 14 and will require about 7800 tons. Included in those pending are 2550 tons for sewer construction in Louisville, Ky., 1100 tons for a hospital in Buffalo and 1000 tons for a Federal warehouse in Washington. Awards follow:

STATE OF MASSACHUSETTS, 500 tons, State roads, to Truscon Steel Co.
CAMBRIDGE, MASS., 125 tons, Harvard College memorial chapel, to Concrete Steel Co.
STATE OF NEW JERSEY, 114 tons, highway construction, route 2, section 6, awarded by Anderson Construction Co., Port Richmond, Staten Island, to McClintic-Marshall Corpn.
CICERO, ILL., 100 tons, Post Office, to Olney J. Dean & Co.
SAN FRANCISCO, 110 tons, Girls High School addition, to Gunn, Carle & Co.
LOS ANGELES, 381 tons, city purchasing agent's stock requirements, to Blue Diamond Corpn.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 100 tons, garage.
BRENTWOOD, N. Y., 500 tons, State hospital buildings.

Kearney & Trecker Corpn. Appoints Dealer Agents

Combination of two methods of selling machine tools, by direct sales organizations and through dealers, has been effected by the Kearney & Trecker Corpn., Milwaukee, in its Chicago, Cleveland and Detroit territories. In Chicago, the Marshall & Huschart Machinery Co. has been appointed as the company's dealer representative, and in Cleveland and Detroit the Motch & Merryweather Machinery Co., Cleveland, also having a Detroit sales office, will be dealer representative.

The entire present personnel of district managers, sales and service men will be retained by the Kearney & Trecker Corpn., and for the present at least it will continue its sales offices in the three districts. While these direct factory representatives will not give up direct sales, they will cooperate closely with the dealer organizations. The latter will handle only the Kearney & Trecker line of milling machines.

It is said that the consolidation of the two methods of merchandising machine tools has never been attempted before on a large scale. The company expects by the plan to con-

YONKERS, N. Y., 220 tons, metal reinforcement for cross county parkway, State Park Commission.

STATE OF NEW JERSEY, 400 tons, highway construction in Bergen County; George M. Brewster, Bogota, N. J., general contractor.

STATE OF NEW JERSEY, 450 tons, highway construction on route 25; John C. Kavanaugh, Inc., Bayonne, N. J., general contractor.

STATE OF NEW JERSEY, 100 tons, highway construction, route 25, sections 6A, 5A and 4B; Riverside Concrete Co., Riverside, N. J., general contractor.

BUFFALO, 1100 tons, hospital of Buffalo division of Sisters of Charity.

WASHINGTON, 275 tons, American Embassy building in Paris; Hegeman-Harris Co., New York, general contractor.

WASHINGTON, 1000 tons, Federal warehouse at C, D, Eighth and Ninth Streets, S. W.

LOUISVILLE, KY., 2550 tons, Mill Creek trunk sewer construction.

CHICAGO, 700 tons, elevated drive at Ogden slip; A. Johnston, general contractor.

CHICAGO, 5000 tons, Post Office; John Griffiths & Son Co., Chicago, low bidder on general contract.

VISALIA, CAL., 130 tons, Union High School; Kyle & Co., Fresno, general contractors.

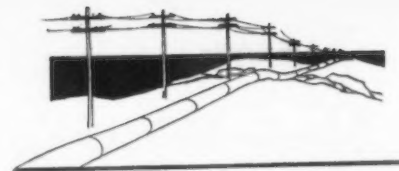
LOS ANGELES, 100 tons, hospital at Crenshaw Boulevard and Sixty-sixth Street.

SANTA ANA, CAL., 100 tons, municipal museum.

LOS ANGELES, 1200 tons, mole for Fish Harbor; Merritt, Chapman & Scott, low bidders on general contract.

tinue to render the service that may be supplied by specialists in the milling machine field, both in sales and service, and at the same time have the cooperation of strong dealer organizations and that under the plan there will be a better coverage of the territories affected and that it will be possible to render a broader service to users of milling machines. Carrying out of the plan is expected to result in some increase in sales expense in the territories affected, but the company believes that this will be justified by an increase in the volume of business.

Pressed Steel Car Co., Pittsburgh, has awarded the Austin Co., Cleveland, a contract for a new Chicago plant to replace one recently burned. Contract calls for six one-story brick and steel buildings, the largest 90 x 360 ft. The project represents an investment of \$60,000. This and other contracts taken by the Austin company during the past two weeks amount to more than \$500,000. These include the construction of 14 service stations in St. Louis for the Phillips Petroleum Co., a warehouse addition in New York for the New York, New Haven & Hartford Railroad and a fertilizer plant in East St. Louis for the Virginia-Carolina Chemical Co.



PIPE LINES

Texas Empire Pipe Line Co., jointly controlled by the Texas Corpn. and Cities Service Co., has placed orders for 207 miles of 12 $\frac{1}{4}$ -in. pipe with four makers, for an oil-carrying line in Texas. The A. O. Smith Corpn., Milwaukee, received nearly half of the order, and the remainder was divided among National Tube Co., Republic Steel Corpn. and Youngstown Sheet & Tube Co. The total of the orders is 27,000 tons.

Standard Oil Co. of New Jersey has placed 35 miles of 8-in. pipe with Bethlehem Steel Corpn.

Columbia Gas & Electric Corpn. has ordered 2000 tons of gas pipe for the Middle West from National Tube Co.

Belvoir Boulevard water main, Cleveland, requiring 2500 tons of steel pipe, has been placed with Farrar & Trefts, Buffalo.

Iroquois Gas Co., Iroquois Building, Buffalo, is planning a pipe line to natural gas field near Elmira, N. Y., extending from a point near Colden, N. Y., for service at Buffalo and vicinity, to cost \$500,000.

Keystone Pipe Line Co., Harrisburg, Pa., has secured permission to build oil pipe lines for service in different parts of Dauphin County, including Derry and Conewago Townships.

Belmont Quadrangle Drilling Co., Belmont, N. Y., is planning a pipe line from Wayne natural gas field to Hammondsport and Bath N. Y., by way of Coshocton Valley to Dansville, to cost over \$200,000.

Township of Kearny, N. J., will open bids this week on about 800 tons of 30-in. steel pipe for a water main.

It is reported from Fort Worth, Tex., that the Tidewater Associated Oil Co. will build its own pipe line outlet from east Texas to the Gulf Coast. A new pipe line may be built, or a partnership arrangement may be entered into with some other pipe line company. A line 200 miles long will be required.

Railroad Equipment

Inland Steel Co. has ordered 525 mine cars from Koppel Industrial Car & Equipment Co.

Lehigh Valley has ordered two gas-electric locomotives from Electro-Motive Co., two oil-electric locomotives from American Locomotive Co. and one oil-electric locomotive from Ingersoll-Rand Co.

Carnegie Steel Co. has contracted with Greenville Steel Car Co. for the repair of 30 hopper cars and has placed an order with the same company for 30 hopper car bodies.

Northern Pacific has ordered 500 underframes and 500 superstructure sets for box cars from Pressed Steel Car Co.

Instalment Sales of Commodities on International Basis Urged

Loans of Products Rather Than Money Held to Be Surest Method of Stimulating Recovery

COMMODITY loans, rather than money loans, are recommended as a "practical plan to bring early recovery" in an article by Charles Benedict in the Aug. 8 issue of *Magazine of Wall Street*. C. G. Wyckoff, publisher of that journal, characterizes the plan as "not only sound and workable" but as having "existing machinery" available "for carrying it through."

The scheme is apparently similar to that proposed by the Administration for the sale of wheat and cotton to Germany. Instead of lending money to possible customers, i.e., supplying a bank account, against which to draw on account of purchases made, it is proposed to make use of the system of long-term credit familiarly known as instalment selling. "The advantage of selling goods abroad on the instalment plan instead of lending cash," says the author, "enables us to pick and choose our buyers and markets. A loan of cash might not result in an outlet for our goods. By thus taking the initiative we sell what we want to sell where we want to sell it, when we want to sell it."

He points out that instalment selling quadrupled the automobile market. "What is more, nobody lost by the enormous credit extended, either in good times or bad. Discount or financing companies were established, and as it became increasingly evident that risks were sound, that repossessions and defaults in payment were no more than a fraction of 1 per cent, instalment paper became a commonly accepted, easily discountable credit instrument. The fact that this plan was used during the boom to oversell an already saturated market of known buying power is not the fault of the instalment plan idea, but its application."

Commodity loans should be made to countries in need of goods but without current purchasing power, the author states. "We have an abundance of goods—more than we can use—so much indeed that we have considered destroying it or giving it away. In Brazil they are getting rid of surplus coffee by burning it. Yet there are millions of potential customers in various parts of the world for goods and who are in need of the very essentials of life."

"It is not only humane, but good common sense as well to supply these people with the commodities which they need, on a long-term credit basis, because by doing so we increase the value of the goods of the remaining normal supply to a point where it

more than equals the amount sold in this way." It is imperative, according to Mr. Benedict, that the excess stocks of commodities be "lifted from the bent back of business and restricted and depressed markets relieved of the surpluses which keep the prices of cotton, wheat, copper, coal and other raw materials below the cost of production, if we are to experience an early termination of the depression."

Youngstown Opposed to Freight Rate Advance

Directors of the Youngstown Chamber of Commerce on Monday instructed the traffic committee, composed of leading shippers, to enter a protest against proposed increases in railroad freight rates asked by the carriers. Members were instructed to draft a protest and present it to the Interstate Commerce Commission at Washington.

Leading iron and steel companies will join the chamber in its fight against the advance, contending it will accentuate the disadvantage of the Youngstown district companies as compared with competing districts, such as Cleveland, Pittsburgh and Buffalo, which enjoy the advantages of water transportation.

Granite City Industries Approve Rate Advance

The Industrial Bureau of the Granite City district, Illinois, has adopted a resolution approving the request of the railroads for an increase in freight rates. The resolution is as follows:

Whereas we have become convinced that an emergency has arisen which calls for emergency treatment, as regards the economic situation of our steam railroads: In that railroad credit has suffered serious impairment, and threatens to be still more seriously affected; and in that railroad purchasing power has in consequence been greatly curtailed, resulting in a serious slackening of industrial activity in all railroad supplying lines; and

Whereas this district is largely dependent upon railroad prosperity and railroad buying, and due to lack of such buying in usual volume, the purchasing power of the community has been greatly curtailed, creating a very serious local economic situation:

Therefore be it resolved that this association go on record as favoring and indorsing the plea of the railroads for a horizontal increase in rates, said in-

crease to be granted at the earliest possible date and for a sufficient period to give it a fair test, and to be accompanied by an investigation to determine what other measures should be taken, including review of wage schedules and alleged uneconomic practices, to place our railroads in sound economic condition and in proper relation to other methods of transportation.

Be it further resolved that copies of this resolution be transmitted to the Interstate Commerce Commission, to the St. Louis Chamber of Commerce, the Illinois Chamber of Commerce, the United States Chamber of Commerce, and the press.

Unfilled Tonnage Lowest Since September, 1930

With a decline of 74,507 tons to a total of 3,406,816 tons, the unfilled orders of the United States Steel Corp., as of July 31, dropped to the lowest figure since September, 1930, when the total was 3,424,338 tons. Last year the July total increased 53,991 tons, while in July, 1929, there was a decrease of 168,733 tons.

Unfilled tonnage at the end of each month for the past two and a half years follows:

	1931	1930	1929
January	4,132,351	4,468,710	4,109,487
February	3,965,194	4,479,748	4,144,341
March	3,995,330	4,570,653	4,410,718
April	3,897,729	4,354,220	4,427,763
May	3,620,452	4,059,227	4,304,167
June	3,479,323	3,968,064	4,256,910
July	3,406,816	4,022,055	4,088,177
August	.....	3,580,204	3,658,211
September	.....	3,424,338	3,902,581
October	.....	3,481,763	4,086,562
November	.....	3,639,636	4,125,345
December	.....	3,943,596	4,417,193

Classification Basis for Scrap in Indiana

The Indiana Supreme Court has affirmed a decision of the Marion County Circuit Court, which puts scrap iron shipments on a classification basis. The case went to the county court as an appeal from the Public Service Commission, which in 1928 passed an order fixing new rates for scrap iron shipments which generally constituted reductions. O. R. Livinghouse, traffic manager of the Public Service Commission, plans to put the new rates into immediate effect unless further action is taken by the railroads.

Foreign Barbed Wire Reaches Chicago

The Swedish freighter *Anna* docked at the Chicago plant of Montgomery Ward & Co. on July 28 with a cargo of 1500 tons of merchandise, most of which was barbed wire from Antwerp, Belgium. The major part of the barbed wire was consigned to Montgomery Ward & Co., although some of it was delivered to the Chicago plant of Sears, Roebuck & Co. The cargo also contained steel channels.

Where Steel Exports Went in First Half of Year

Canada Took 125,349 Tons of Nine Leading Items—Philippines, in Second Position, Took 14,739 Tons, Followed by Mexico, 13,364 Tons; Japan, 11,836 Tons; Argentina, 9,247 Tons; Chile, 8,830 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930
Totals	4,195	6,276	28,865	61,635	6,039	7,617	31,500	56,015	7,645	6,862	46,742	67,771
Canada	3,105	4,456	24,072	49,282	369	1,255	2,913	13,183	4,966	4,386	27,798	40,145
Japan	47	136	19	994	41	306	197	1,611	202	229	1,359	6,254
Cuba	542	135	189	1,078	275	296	1,074	2,359	47	13	140	445
Philippine Islands	87	218	2,166	471	3,557	1,628	9,312	11,297	8	607	760	2,483
Mexico	48	218	462	798	282	520	2,667	2,495	412	140	978	1,377
Argentina	48	218	54	.....	36	88	193	1,057	57	68	2,438	1,704
Chile	3	.....	273	.....	3	.....	1,048	820	146	.....	1,440	.....
Colombia	3	.....	10	.....	161	173	1,294	1,422	1	196	82	359

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930
Totals	1,699	7,750	19,127	54,559	1,705	4,790	14,181	22,651	964	1,872	7,398	15,575
Canada	325	1,262	5,153	6,541	136	509	1,232	1,927	158	475	1,516	4,593
Japan	207	1,416	1,815	4,913	.....	.....	.....	.....	25	9	128	322
Cuba	475	230	598	2,795	99	359	863	1,764	35	102	284	605
Philippine Islands	324	533	1,787	2,457	102	92	524	618	60	37	190	206
Mexico	3	25	94	453	233	627	2,442	3,610	102	121	578	949
Argentina	.....	551	661	1,079	56	282	744	2,497	95	338	1,398	4,064
Chile	.....	1,864	541	15,297	.....	.....	55	.....	.....	60	.....	.....
Colombia	39	7	30	3,223	249	118	881	959	17	.....	286	.....
Brazil	151	.....	1,027	1,830	229	1,857	3,826	4,351	126	82	420	433
China	.....	.....	.....	45	.....	.....	.....	.....	2	.....	2	.....

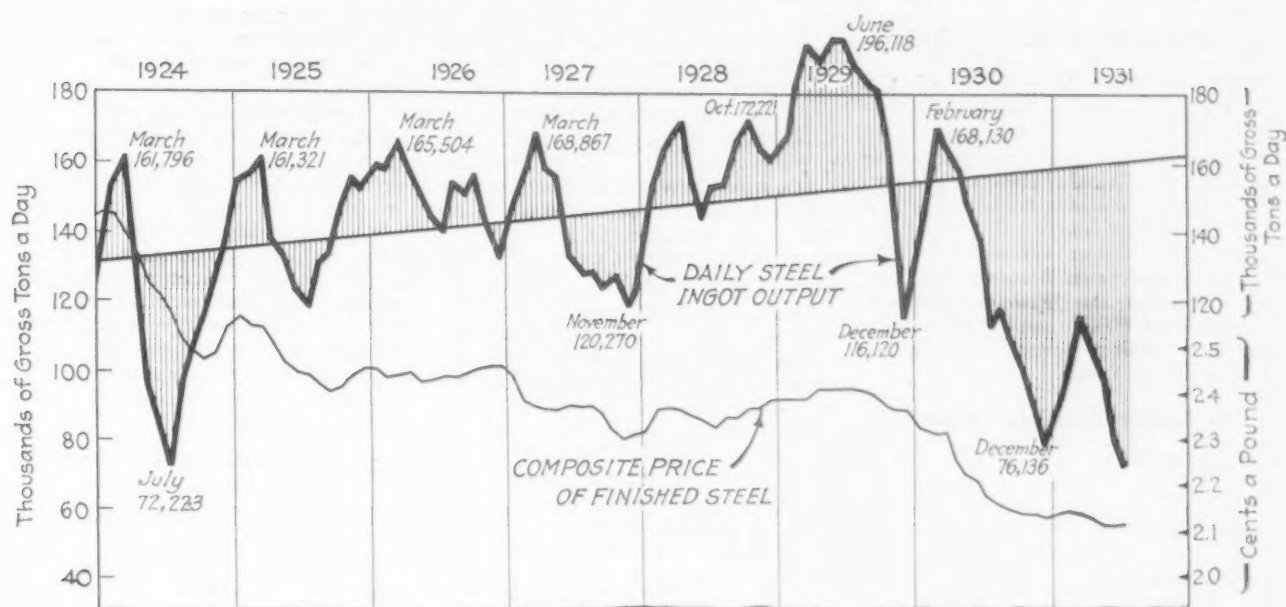
	Tin Plate				Steel Bars				Plain Heavy Structural Material			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930
Totals	5,113	15,577	48,394	121,104	2,921	7,245	25,036	56,280	8,139	10,229	54,011	79,166
Canada	243	4,482	2,936	20,169	964	3,396	12,647	27,219	6,559	9,013	47,077	64,212
Japan	577	4,259	8,035	35,563	23	51	114	1,585	2	575	169	3,681
Cuba	192	431	1,588	2,178	5	335	174	1,208	4	86	224	1,814
Mexico	514	782	5,688	6,445	26	95	146	723	25	64	309	413
Argentina	776	730	3,598	6,941	4	74	108	391	.....	6	53	1,126
Chile	57	728	730	2,449	246	312	1,982	3,947	124	98	2,701	1,571
Brazil	399	153	2,198	1,635	23	43	186	475	2	.....	6	.....
China	1,440	1,407	5,208	15,099	337	.....	924	.....	28	.....	28	.....
British India	.....	12	.....	5,229	1	.....	.....	.....	.....	.....	.....	.....
United Kingdom	.....	.....	.....	.....	545	1,591	3,565	5,201	.....	.....	.....	.....
Italy	281	1,250	1,324	6,482	.....	.....	.....	.....	.....	.....	1	.....

Destination of Iron and Steel Products

(In Gross Tons)

Country	January Through June					Country	January Through June				
	June, 1931	May, 1931	June, 1930	1931	1930		June, 1931	May, 1931	June, 1930	1931	1930
North and Central America and West Indies	38,771	51,405	75,509	324,209	583,656	Italy	1,101	1,243	2,807	4,044	41,527
Canada and Newfoundland	29,875	43,082	60,302	268,956	474,771	Norway	335	117	2,333	1,424	4,791
Cuba	1,781	1,491	3,897	9,744	24,122	Soviet Russia	811	33	908	1,682	7,014
Guatemala	327	153	349	1,290	1,860	Spain	3	44	405	124	10,905
Honduras	74	209	620	1,126	3,827	United Kingdom	2,780	2,482	4,500	15,943	25,595
Mexico	4,440	3,946	7,144	26,115	51,724	Other Europe	1,223	1,062	1,351	7,763	17,695
Panama	706	1,409	1,043	7,392	9,789	Far East	21,507	18,633	50,116	113,198	346,030
British West Indies	809	295	1,334	2,778	7,955	British Malaya	103	87	447	1,382	4,308
Other West Indies	158	188	425	3,343	6,437	China	3,675	2,645	2,908	22,522	25,811
Other Cen. America	601	632	395	3,465	3,171	Netherlands East Indies	328	607	1,948	3,758	22,326
South America	6,907	14,010	18,202	77,835	159,153	India and Ceylon	695	1,432	236	7,946	11,129
Argentina	2,239	6,357	3,663	20,747	28,792	Hong Kong	255	317	129	4,065	2,906
Brazil	1,321	843	3,971	10,419	23,180	Japan	6,924	6,877	36,905	38,183	219,235
Chile	737	2,024	5,466	20,526	42,374	Kwantung	35	97	87	336	6,347
Colombia	1,112	760	1,216	6,465	16,416	Philippine Islands	8,538	6,387	6,488	32,113	37,374
Peru	444	1,360	902	8,253	9,235	Australia	147	82	483	1,160	6,140
Uruguay	550	1,271	1,695	3,878	11,226	New Zealand	56	61	263	504	2,263
Venezuela	451	859	1,095	6,464	24,854	Other Asia and Far East	751	41	217	1,829	8,191
Other So. America	53	536	194	1,083	3,076	Africa	101	1,899	1,371	6,728	11,556
Europe	8,299	5,460	14,075	39,572	122,227	Union of So. Africa	26	1,030	513	2,158	2,610
Belgium	1,428	99	1,254	1,924	5,913	Egypt	58	141	116	1,599	2,500
France	608	341	446	6,111	4,589	Mozambique	3	693	78	1,684	2,278
Germany	10	39	71	557	4,198	Other Africa	14	35	664	1,287	4,168
						Total	75,585	91,407	159,273	561,542	1,222,622

Ingot output in July showed a further decline of 9½ per cent after June had dropped 17 per cent from May. The total was the smallest for June since 1921. Prices averaged a trifle better.



Ingot Production Continues Downward, But at More Moderate Loss

CONTINUING the decline begun in April, steel ingot production in July is reported by the American Iron and Steel Institute at about 9½ per cent below the June figure. June was 17 per cent under May, May about 8 per cent under April, and April 9 per cent under March. The figures include open-hearth and Bessemer ingots only.

Production of these classes of ingots in July is calculated by the institute at 1,876,149 gross tons. This is more than 100,000 tons below the low figure of last December, and is the smallest for any month since December, 1921. It is only 1640 tons less than that for July, 1924, however, and about 15,000 tons under that for January, 1922. It represents a drop of

about 36 per cent from July, 1930, and of more than 60 per cent from July, 1929, which was the highest tonnage ever made in the seventh month.

On the daily basis, production was 72,160 tons, a drop of 39 per cent from the year's peak of 115,139 tons reached in March. This makes the smallest July average since that of 1921, at 86,713 tons. In July, 1924, however, only 72,223 tons was made, and that figure included electric and crucible ingots also, so that probably last month's tonnage was a little above that of 1924.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Gross Tons)

	Reported by Companies Which Made 95.21 Per Cent of the 1930 Ingots		Calculated Output of All Companies		No. of Working Days
	Open-Hearth	Bessemer	Monthly	Daily	
Total, 1929.....	44,101,321	7,091,680	54,312,279	174,639	311
1930					
January	3,157,761	441,572	3,778,235	129,935	27
February	3,335,428	508,618	4,035,111	168,130	24
March	3,513,269	539,616	4,254,331	163,628	26
April	3,405,671	509,234	4,109,492	158,067	26
May	3,265,353	528,968	3,982,915	147,515	27
June	2,849,079	407,586	3,418,535	126,739	25
Six months.....	19,526,561	2,935,594	23,578,619	152,120	155
July	2,430,128	353,723	2,922,220	112,393	26
Seven months....	21,956,689	3,289,317	26,500,839	146,413	181
1931					
August	2,541,367	374,467	3,050,763	117,722	26
September	2,275,910	429,975	2,840,379	109,245	26
October	2,165,341	399,704	2,692,539	99,724	27
November	1,807,133	360,339	2,212,220	88,489	25
December	1,659,026	226,786	1,979,547	76,136	26
Total, 1930.....	32,405,466	5,020,588	39,286,287	126,322	311
1931					
January	2,044,298	296,620	2,458,689	91,063	27
February	2,085,529	296,972	2,502,366	104,265	24
March	2,504,060	346,139	2,993,590	115,139	26
April	2,275,404	316,668	2,722,479	104,711	26
May	2,083,833	301,639	2,505,485	96,365	26
June	1,730,109	246,365	2,075,910	79,843	26
Six months.....	12,723,233	1,804,403	15,258,519	98,442	155
July	1,561,251	225,030	1,876,149	72,160	26
Seven months...	14,284,484	2,029,433	17,134,668	94,667	181

Seven-Month Total Off 35 Per Cent

Production in the seven months is calculated at 17,134,668 tons. This is about 35½ per cent below the 26,500,839 tons in the first seven months of last year. Bessemer tonnage in this comparison dropped off about 38.2 per cent from last year, and open-hearth about 34.9 per cent, in keeping with the similar showing for the six-month period.

These figures do not include electric or crucible steel. About 0.8 per cent should be added to the tonnage figures given, to allow for these grades.

On the basis of estimated capacity as of Dec. 31 last, production in July is given by the institute at 33.97 per cent, compared with 37.58 per cent in June. For the seven months the average was 44.56 per cent, compared with 73.13 per cent a year earlier.

Russia's New Views on Labor and Management

WHAT have been some of the changes in the Russian government's attitude toward labor, wages, the technicians and industrial management may be learned from an address of Joseph Stalin, general secretary of the communist party of the Soviet Union, made at a conference of industrial directors in Moscow, June 23, and printed in the *Economic Review of the Soviet Union*, published by the Amtorg Trading Corp., 261 Fifth Avenue, New York.

No Longer Equalized Wages

It appears that labor turnover had been on the increase, ("few enterprises where the turnover has not been at least 30 to 40 per cent during the half or even quarter year"), and the conclusion was reached that "it is necessary to eliminate the equalization of wages and the old wage scale. We must not tolerate a situation where a steel worker receives the same wage as a sweeper, or a locomotive engineer the same as an office clerk."

Also, said Mr. Stalin, "To provide our enterprises with labor it is necessary to achieve the attachment of the workers to the enterprises, to make their staffs more or less permanent." The workers "can be attached to the enterprise only by promotions, by wage increases, by establishing

scales which would be an incentive to acquiring greater skill."

Trouble had developed, also, it seems, over plants going over "to the new working week too hurriedly, without sufficient preparation, without properly organizing shifts and without instituting responsibility for a given task. It is no wonder the workers say, 'We could increase the productivity of labor and could improve the situation, but who would appreciate us when no one is responsible for anything?'"

"Irresponsibility," said Mr. Stalin, "can and must be destroyed only by us, because we all are at the wheel of power." And his suggestion of the cure is either to change the conditions under which the continuous working week was introduced, or, in other places where conditions are not conducive to such an experiment, to do away with the continuous working week on paper and adopt temporarily a six-day week with one day rest, as was done at the Stalingrad tractor plant and then prepare the ground for returning later to a real continuous working week.

Old Technical Class Coming into Favor

As to managerial personnel, he had this to say: "Our country has entered that phase of its development when the working class must create its own industrial-technical intelligentsia, which will be able to defend its interests in industry as the interests of the ruling class. No ruling class in

history has been able to get along without its own intelligentsia. . . .

"The problem should not be to discourage those who have initiative, but to be quick to advance them to managerial positions. . . . "Our policy with respect to the old technical intelligentsia must change accordingly. If at the highest point of the damaging activities our policy was that of destroying the saboteurs, now, when this intelligentsia is turning toward the Soviet government, our attitude must be to attract them to us and concern ourselves about them. It would be stupid and senseless if we were now to look upon practically every specialist and engineer of the old school as if he were an uncaptured criminal or damager."

Individual Management Regarded Essential

In respect to management, Mr. Stalin emphasized it as essential that the present unwieldy industrial combinations, sometimes including 100 to 200 enterprises, be broken up into several smaller combinations. He regarded it essential also that the industrial combines pass from collegium (board) to individual management. As matters stand now, ten or fifteen people sit on the collegiums of the concerns writing papers and carrying on discussions. "We must not continue to manage industry in this way. Let a chairman and a few assistants remain at the head of enterprises. The best thing for the other members of the collegium would be to go down into the shops and factories."

Reclaiming Iron from Slag

(Concluded from page 439)

48 in., at the head of a short belt conveyor above the screens.

All of the screens are of the vibrating type. By them the material is graded into the customary commercial sizes and delivered to the various storage bins on the second floor of the building. As vibration has been confined to the screens by an ingenious arrangement of spring suspension, a considerable portion of the noise and vibration is eliminated. Delivery of ballast for consumers can be made either to trucks or to traction cars run in on three lines of track directly under the storage bins. The plant is

designed for a maximum production of 4500 yards daily.

At present a considerable proportion of the product goes to contractors in the Chicago area for use in concrete work. Local railroads and trac-

tion lines use the material for concrete aggregate and track ballast. An outlet for the fines is provided in high-grade mastic roofing and similar work where fire resistance is important.

RECLAIMED iron pile at crushing plant. Three chutes, as shown, deliver the iron from the magnetic separators. It is taken away in railroad cars as it accumulates. Slag for ballast or other use is delivered into trucks or cars, from storage bins above the passageway shown at right.



PERSONALS

MARTIN B. ARMSTRONG, since 1904 president of Thomas & Armstrong Co., London, Ohio, has resigned his position to devote more time to his duties as vice-president of the W. E. Lamneck Co., Columbus, Ohio, sheet metal equipment maker. Mr. Armstrong will take active charge of the sales department of the Lamneck company, which is producing a new line of sheet metal farm equipment. He retains an interest and a directorship in the Thomas & Armstrong Co., being succeeded as head by R. W. BOYD, president of the London Exchange Bank and treasurer of the company for 20 years. C. A. BANGERT, for many years shop superintendent of Thomas & Armstrong Co., has also resigned his position to take charge of manufacturing the Lamneck company's new products.

T. J. FOSTER, National Bridge Works, Long Island City, has been elected director and assistant treasurer of the American Institute of Steel Construction.

H. H. MORGAN, designer of a number of conveyor installations in the automobile industry, has been appointed special engineering representative, with offices at 10228 Woodward Avenue, Detroit, for the Weller Mfg. Co., Chicago. For the past several years, he was assistant chief engineer of the Palmer-Bee Co., Detroit, and previous to that connection was associated with Webster Mfg. Co., now affiliated with the Weller company.

R. A. WEAVER, president, Ferro Emanuel Corp., Cleveland, will sail Aug. 16 for Europe, where he will visit the Ferro plant at Rotterdam and branches in England, France and Germany.

FRED N. ROWE, recently identified with Waldo, Egbert, Maltby & Ward, Inc., Pittsburgh, where he handled the sale of Durbar bearing bronze made by the Buffalo Bronze Die Cast Corp., Buffalo, is now representing the company directly, with headquarters at Pittsburgh.

LEO G. HALL, consulting engineer on problems and designs connected with high-temperature, high-pressure and electrochemical technique and apparatus, has become a member of the staff of the Ryerson Physical Laboratory at the University of Chicago, in connection with research in metals and alloys for optical purposes. He will continue his private consulting practice.

C. QUINCY IVES, recently identified with the E. F. Keating Pipe Bending & Supply Co., Boston, has been appointed manager of the New England office of the Simmons Pipe Bending Works, Newark, N. J. He will also act as factor for the National Pipe Bending Co., New Haven, Conn., specializing in its line of coils, bent tubular products and spun brass goods.

WILLIAM W. WEST, for the past 10 years with Steel & Tubes, Inc., Cleveland, has resigned as general superintendent of the Elyria division of the company.

W. FORMAN BICKEL, treasurer, Harbison-Walker Refractories Co., Pittsburgh, has been elected a director of the company, succeeding J. B. CULLOM, who has resigned.

WILLIAM EDES, Detroit representative of the Van Norman Machine Tool Co., Springfield, Mass., will leave for Russia next month to supervise installation of grinding equipment

sold to that country by his company. He does not expect to return to Springfield until February, 1932.

J. C. WILLIAMS, president, Weirton Steel Co., Weirton, W. Va., will return next week from an automobile trip in Europe.

JOHN J. STANTON has been appointed Milwaukee manager, Westinghouse Electric & Mfg. Co., in charge of the Wisconsin and Upper Michigan territory, with headquarters in the First Wisconsin National Bank Building. He joined the Westinghouse organization in 1916 as a salesman in the Wisconsin territory, and since 1926 has been merchandise manager for the Northwest district, with headquarters in Chicago.

E. M. ANDERSON has been transferred from the Batavia, N. Y., plant of the Massey-Harris Co. to Racine, Wis., to become purchasing agent of its plant, acquired from J. I. Case Plow Works several years ago.

Spang, Chalfant to Make Electric Welded Pipe

Spang, Chalfant & Co., Inc., Pittsburgh, subsidiary of the National Supply Co., New York, will erect a mill addition at its Ambridge, Pa., plant for the experimental production of electric-welded steel pipe. Approximately \$1,000,000 will be spent in equipping the new unit, which will produce under a process of the company's own development. Although the size of the pipe to be produced has not been definitely determined, it is likely that material ranging up to 30 in. O. D. will be turned out. This would be somewhat larger than any of the present electric weld installations have been called upon to supply heretofore, although at least two companies have turned out electric welded pipe 26 in. in diameter. Present makers of this type of pipe, in order of their entrance into the field, are the A. O. Smith Corp., Milwaukee; the Republic Steel Corp., Youngstown; the National Tube Co., Christy Park, Pa., and the Youngstown Sheet & Tube Co., Youngstown.

Spang, Chalfant & Co., with its predecessor, the Etna Iron & Tube Works, Etna, Pa., is the oldest maker of tubular goods in the United States, the original works at Etna having been built in 1828. The present in-

stallation at that point consists of three butt-weld and four lap-weld furnaces, with an annual capacity of 300,000 tons of black and 60,000 tons of galvanized pipe. In January, 1928, the company was merged with the Standard Seamless Tube Co., Ambridge, Pa., the combined companies thereafter being known as Spang, Chalfant & Co., Inc. The Ambridge plant has capacity for 350,000 tons of seamless tubing per year, ranging from 2 in. to 15 in. O. D. About a year ago the company was acquired by the National Supply Co., maker and distributor of oil well supplies, and since that time has been operated as a subsidiary.

Trackwork Output Off 22 Per Cent in July

Production in July of trackwork for T-rail tracks of 60 lb. and heavier, according to report of the American Iron and Steel Institute, amounted to 4409 net tons, a decline of 22 per cent from the June output of 5705 tons. It also compares with 8774 tons in July, 1930, and is the smallest month's total since that of November, 1930. Production for the first seven months of 1931 amounted to 47,022 tons, while the total for the same period last year was 83,084 tons.

OBITUARY

Alva C. Dinkey

ALVA CLYMER DINKEY, "one of the ablest all-around steel men in the country," as Chairman Gary of the United States Steel Corporation, was able to say of him in 1915, when he resigned the presidency of the Carnegie Steel Co., to become president



ALVA C. DINKEY

of the Midvale Steel & Ordnance Co., died suddenly Aug. 11 at his home at Wynwood, Philadelphia. Three months ago he suffered an attack of pneumonia, from which he had not thoroughly recovered. He was born 65 years ago on Feb. 20 at Weatherly, Pa.

Mr. Dinkey could claim to over 50 years' identification in the steel business, for he entered the Carnegie service as water boy at the Edgar Thomson works at the age of 13 years. He was telegraph operator at the age of 19. Then for about three years he was machinist at the Pittsburgh Locomotive Works, then becoming expert machinist for the McTighe Electric Co., Pittsburgh, a company antedating the Westinghouse institution in introducing electric light commercially in that city. He went to the Homestead Works in 1889 and successively was secretary to the superintendent, electrician, superintendent of the electric light and power plant, assistant to the general superintendent, general superintendent (1901) and president of the Carnegie company (1903).

In the earlier part of this period particularly, Mr. Dinkey made his notable contributions to the rolling mill. He was the first to introduce electricity to drive the feed tables. He also introduced electric cranes, assisted in the development of the

electric charging machine, patented one such machine and is the patentee of the Dinkey electric controller.

He remained president of the Midvale Steel & Ordnance Co. until 1923, when substantially all but what is now the Midvale Steel Co., Nicetown, Philadelphia, passed into the control of the Bethlehem Steel Co. As president since then of the Midvale company he brought to bear his experience as an operating steel man to the problems of making heavy forgings and steel vessels required to withstand high temperatures, high pressures and corrosion action, a notable development that has marked the progress of recent years. And in connection with this work he had taken a prominent part in engineering circles, including the Engineering Foundation, of which he had been a board member since 1926, giving special attention to that body's furtherance of the studies on the alloys of iron.

He was a director of the American Iron and Steel Institute and a member, among others, of the two national engineering societies of electrical and mechanical engineers, the Engineers' Society of Western Pennsylvania and the American Association for the Advancement of Science.

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FRED C. BOLTON, of the engineering department of the Perkins Machine & Gear Co., Springfield, Mass., died suddenly in a hotel at Berlin, Vt., on Aug. 1, aged 56 years.

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Scrap Specifications May Be Revised

Uniformity of scrap iron and steel specifications may be a development in the near future as the result of a conference between a representative of the Department of Commerce and Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel. It is said that the scrap classification, published in 1926 by the Department of Commerce, in cooperation with the American Railway Association and the National Association of Purchasing Agents, has not been completely accepted by the steel industry and others interested in scrap. In sending a representative to the Institute of Scrap Iron and Steel, the Department of Commerce expressed a desire to secure the cooperation of the institute in revising the specifications, if necessary, and in bringing about a greater acceptance of the standard specification.

As a first step in this direction, the institute has appointed a railroad scrap committee, which will shortly

present recommendations to the American Railway Association for the modification and clarification of railroad scrap specifications. It is expected that a similar conference will be held between the Institute and the National Association of Purchasing Agents, after which the Department of Commerce may call a national revision conference of all interested parties to secure approval of revised specifications for scrap iron and steel.

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Some Manufacturers Are Increasing Operations

Cleveland Tractor Co., Euclid Avenue and East 193d Street, Cleveland, is arranging for increased operations, following curtailment for several weeks, and will add about 500 men to working force. Company has secured considerable new business, including an order for 125 tractor units from State Highway Department, Pennsylvania, totaling about \$400,000.

United States Radio & Television Corp., Marion, Ind., is advancing production to more than 2000 complete radio sets daily, giving employment to over 1000 persons.

Keystone Aircraft Corp., Bristol, Pa., has secured contract from Navy Department, Washington, for seven amphibian airplanes at cost of \$164,062, and will increase production schedule.

General Electric Co., Schenectady, N. Y., will increase operations at branch plant at Pittsfield, Mass. Contract has been secured from Commonwealth Edison Co., Chicago, and Super Power Co. of Illinois, an affiliated interest, for battery of 20 transformers, eight of which will be among largest ever manufactured, totaling \$1,000,000. Units will be built at Pittsfield.

Salamanca Furniture Works, Inc., Salamanca, N. Y., formerly known as McCabe Industries, Inc., specializing in production of radio cabinets, parts, etc., is arranging for increased operations and will make additions to working force.

Van Norman Machine Tool Co., Springfield, Mass., next month will ship 65 oscillating grinding machines to Russia to be used in ball and roller plant at Moscow, the Karkov tractor plant, the Autostroy plant where model A Ford cars are manufactured, and the Stalingrad tractor plant.

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Robert W. Hunt Co., Chicago, announces the inauguration of another X-ray laboratory for the determination of quality engineering material. An X-ray department has been established at the Chicago headquarters, equipped for the examination of steel up to 3½ in. thick, of aluminum up to 8 in. thick and of other materials of thickness proportional to their densities.

No Indications of a Rising Trend

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

SOME of the significant price developments during July are illustrated in the chart shown below. These include a slight gain in the Bradstreet index of commodity prices, a little higher average of finished steel prices than in June, as indicated by THE IRON AGE composite of finished steel, a little lower average of pig iron prices, and a distinct gain in heavy melting steel scrap at Pittsburgh. What do these mixed movements mean?

The rise in the Bradstreet index was probably entirely seasonal and will be found to have occurred at this time in most years. Only a few groups of commodities participated, notably provisions and hides, and it was the amount of the increase in a few items rather than the number of items that increased which is responsible for the advance.

The finished steel price increase is more a matter of quotations than of buying and selling, and steel values have not yet been tested. Moreover, the monthly average conceals a turn which came within the month when the quotations for bars, shapes and plates were reduced.

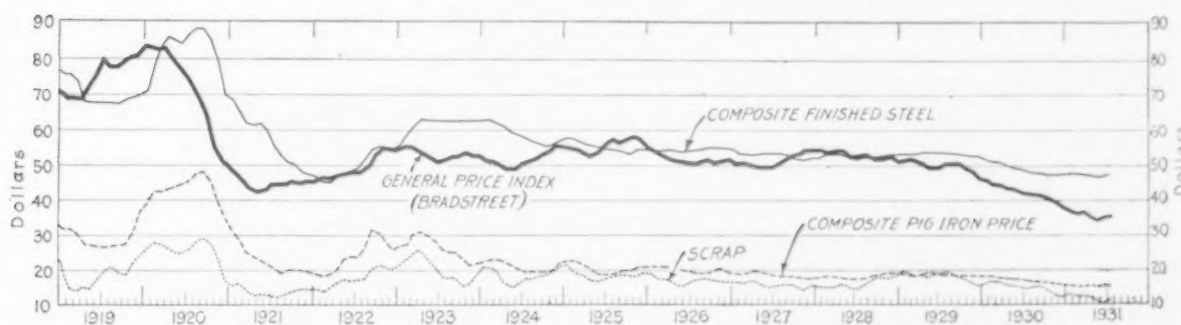
The move in steel scrap has lacked breadth, both as to the items involved and the number of markets affected. The volume of business done has been small. Perhaps it is fair to say that such advances as occurred have been due more to limited supply of certain grades than to activity in demand. Such a move in scrap prices, occurring when steel production is on the decline, either will be short-lived or is to be taken as forecasting a rise in steel production. It will be remembered that scrap prices did not rise in 1921 until after steel production had turned upward.

The decline in pig iron prices probably is most

nearly representative of the real trend of affairs. Aside from the finished steel composite, the pig iron price curve is the smoothest of the four, showing the least erratic fluctuations. It will be remembered that in August and September, 1930, while scrap prices rose, the pig iron index held its steady downward trend.

We find no evidence of a real turn in the general level of commodity prices—certainly not in this seasonal rise in the Bradstreet index. During the past three weeks, a majority of the commodity price changes have been downward. Most of the more sensitive commodity markets have been weak. Perhaps there are more indications of stabilization than formerly, but no indications of a rising trend are to be seen. This conclusion is confirmed by such facts as the decline in bank deposits, the low turnover of bank deposits, the continued large stocks of raw materials and a good many manufactured products, the further declines in consumer purchasing power, and the obvious tendency of the average consumer to buy no more than necessary.

One of the outstanding features is the necessity for further liquidation. There is still an abnormally large amount of frozen credit, not only in this country, but throughout the world. We still occasionally hear suggestions that inflation would be desirable, but it is becoming increasingly evident that the depression has become too deep to make it possible for business to respond to "credit injections." Perhaps the only kind of inflationary price advances that could now be developed would come as the result of an abandonment of the gold standard, with all the disastrous consequences which would attend such an event.



The Bradstreet index of commodity prices and the average of finished steel prices showed slight gains in July, while heavy melting scrap at Pittsburgh registered a rather impressive increase. The average of pig iron prices dipped downward. The rise in the Bradstreet index was merely seasonal.

(ESTABLISHED 1855)

Employment Problem Largely Local

WITH the oncoming of fall and with an increase rather than the hoped-for decrease in the number of unemployed, plans must be laid for giving work to a much larger number of wage-earners. Washington dispatches tell of fresh conferences by the President with leaders in industry who have actively cooperated with him since the memorable White House meeting of business executives late in 1929. It is freely said that one urge to early action is the fear of attempts by members of Congress to start dole payments or to pass other Socialistic measures of relief that would work more harm than good.

Already it is evident that the issue will be even more sharply drawn than was done last year between advocates of wholesale federal appropriations and those who believe that the bulk of the job of providing work for the unemployed and of relieving those for whom work cannot be found can be most effectively carried through by State, county and municipal organizations. The men in Congress whom President Hoover rebuked last winter for trying to make political capital out of human distress in drought-smitten States will again be loud-voiced and impractical in calling for huge federal grants. It is of the utmost importance, therefore, that plans now being made for the greater activity of every employment and relief agency, federal, State and local, be pushed forward rapidly before the campaign of sound and fury opens in December.

It is gratifying to know that \$300,000,000 of federal construction work will be under contract this fall, even though up to this time there has been disappointment at the slow pace of Government activities. Yet at best Government contracts can give employment to but a fraction of the millions now idle. Work on rivers and harbors, public buildings and naval construction can employ but a few of the hundreds of classes of labor on whom the depression has borne down heavily. The same is true also of the road and building construction which various States and counties have undertaken on an enlarged scale to meet the critical situation developed in the past year.

Apart from workers in local building trades it is among the many thousands of wage-earners who have made their living in various forms of "services," personal and otherwise, that the pinch of the depression will be felt most severely. The so-called prosperity of 1928 and 1929 was marked by the most lavish scale of personal luxury expenditure and of outlay for recreation, amusements and social entertainment the country has ever seen. Time and again there was the comment, when displacement of workers by machines was suggested as a possible economic menace, that the free spending of the swelling proceeds of prosperity had

given work to a new army of men and women who might look forward to continued employment in these enlarged services of New Era life.

Last winter's experience shows plainly that a very large part of the organization of job-finding as well as relief must be done under community auspices. What the Prosser Emergency Employment Committee did in New York City (on private subscriptions of \$9,000,000) and what was done in hundreds of smaller cities by the cooperation of citizens' committees and city authorities points the way to the most effective means of meeting the larger demands of the coming winter.

A River Without Tributaries?

RUSSIA is trying to duplicate on its own soil the mammoth industrial organizations that have grown up in the United States. Yet in copying our industrial pattern, the Soviet leaders have shared the illusion of other foreign observers—and many domestic critics as well—that our country is primarily a land of mass production and gigantic corporations. They do not realize that the United States is still predominantly a country of small and medium-size plants.

Only one-half of 1 per cent of our manufacturing establishments, according to the last census, employ over 1000 workers; only 3.4 per cent employ more than 250. It is true, as the National Industrial Conference Board points out, that the plants employing more than 1000 hands each account for almost one-quarter of all our manufacturing workers, but the fact remains that the other three-quarters are in small organizations.

Do these figures merely mean that the United States is laggard in carrying centralization and integration to completion, or do they rather indicate that big business and small business are both essential to a flourishing and well rounded industrial development? Certainly the fecundity of private initiative in small enterprises is as apparent today as it was 40 years ago. Surely the number of "self-made" men who have built up successful business organizations from "scratch" is still impressive.

And we have had numerous evidences of late of an increasing demand for diversification. Large basic industries, like steel, see their future expansion measured by the development of new products and the creation of new wants, realizing that many of their largest present outlets can be traced to small beginnings. Inversely mass production plants themselves have given rise to demands for many new specialties and accessories adapted to manufacture on a small scale.

Reading the future in terms of power, Martin J.

Insull, president, Middle West Utilities Co., prophesies further diffusion of industry, rather than greater integration:

Just as power changed the decentralized industry of 1731 into a centralized industry by 1831, power in 1931 appears to be changing industry back into a decentralized structure. . . . Electricity is available in any quantity at virtually every point on the map, whereas its predecessor, steam power, was to be had at relatively few points. The same is true of transportation, which is, after all, another form of power. And industry is not slow to recognize the advantages of decentralization in terms of lower costs and improved working conditions.

This suggests a multiplication of opportunities for individual initiative and small enterprise. But it by no means bars greater growth for our large basic industries. After all, it takes many tributaries to make a great river. Russia is digging the channel of such a river, but will water flow through it when it is completed?

Wages and Wages

WE have to harp on the subject of wages, for the reason that among all economic subjects that is at present the most important. In the discussion of it there is too much generalization and too little consideration of the ideas of partnership and the fundamental principle of exchange in goods and services.

If an industry is doing well (there are some that continue in that happy situation) it is unnecessary to reduce wages and there is no thought of it. The workers and stockholders in such industries are fortunate partners.

If an industry is doing poorly and is incurring a direct loss in production, it may continue to maintain wages so long as corporate surplus remains. Corporate surplus is, however, only in small part liquid and available for disbursal. In large part the earned surpluses of the past have been put into plant and are not available for disbursal. When available liquid surplus is gone, and perhaps credit also, a reduction of wages becomes inevitable. There may have to be a cessation of all wages.

Another fault with generalization in respect to this subject is the failure to discriminate between wages that are involved in the production of goods and those that are involved in the distribution and use of them. If adjustments are made that maintain the influx of products into a market wherefrom the outlets are strangled, the situation is constantly made worse. In the end the producer has to close the valves controlling inflow so that they will harmonize with those controlling outflow.

This is why the productions of iron, copper, lead, zinc and substantially all materials have had to be curtailed. The correction will not come until many workers forget about the high scales of 1929 and dismiss the fallacies of governmental employment, propagation of buying power and preservation of standards of living; and grasp the idea of exchange of services,

which means making prices that customers can and will pay. This does not spell impairment of buying power and standards of living, but rather improvement of both.

Depression Curtails Steel Exports

SOME remarkable changes have occurred in connection with this depression in the proportions of their steel the various countries have exported. It goes without saying, of course, that exports tend to swing with production, the point being the relative swings and how the respective steel-producing countries fare. In the early years of the American steel industry, when mild steel had largely replaced wrought iron, there was a fond hope that when domestic demand was light we could export more, and help to make up, but the idea never worked. We could not have an important depression here without the rest of the world having reduced requirements also.

It is convenient and illuminating to compare production and exports this year with the year 1928, going just back of the period of general trade recession. Taking the United States, Great Britain, France, Germany, Belgium and Luxemburg, steel production has decreased just one-third, while exports, excluding scrap, have decreased a trifle less. There is no particular significance in the slight divergence.

The big divergence is in how the respective countries have fared. Computing the relationship of exports to production in 1928 and in the fore part of this year, and comparing the latter with the former, the United States has lost 32 per cent, Great Britain 25 per cent and France 15 per cent, while Germany has gained 28 per cent and Belgium and Luxemburg combined have gained 8 per cent. That is, the first-named countries have lost more in export trade than they have in domestic trade, while the other countries have lost more in domestic than in export trade. They all lost something, of course, in both classes of trade.

By no means does the comparison suggest, to illustrate, that the United States has been relatively unlucky and Germany relatively lucky. Exports in some quarters have been more or less a matter of desperation. The United States was not driven to force an export movement; Germany was, it being anything at all to get money or credits. The United States, moreover, conducts so small an export trade relative to total production that a large percentage drop in exports means little in tonnage. The United States has never exported more than a few per cent of the total steel production, whereas, roughly speaking, in 1928 the German pace was close to one-third and the British and French about one-half.

No generalizations are feasible from production and export figures, this presentation being given merely for the facts directly shown. Broadly speaking, steel goes into capital goods on the one hand and into consumption goods on the other. A given non-producing country may at one time be going into construction work and take much steel; with depression it takes very little. Another country may be taking steel for current consumption and when depres-

sion comes its requirements have a relatively small decrease. Each country of course goes in for both classes of steel, simply in different proportions.

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ANOTHER avenue of cost reduction in making steel lies apparently in an intensive study of the chemical composition of ingot molds. Such is the lesson of the article on page 434 of this issue. The author's investigation is suggestive of increased mold life through a specific consideration of the chemical make-up of the molds. Thus he would gain an economy apart from any inherent in design or practice, such as shape of mold, disposition of the metal masses, method of pouring and the like.

▲ ▲ ▲ CORRESPONDENCE ▲ ▲ ▲

Why Not a Rubber House?

To the Editor: An office in the New York financial district, where splendidly built skyscrapers are torn down at ten years of age, brings home to me the lesson of the Neils Poulson house discussed in your issue of Aug. 6. This lesson, which seems to have been ignored in all discussion of steel houses, is that the Poulson house was built too well.

The outstanding fact about this house is that it was built for the ages and was torn down before it had reached the prime of life. Obviously, this is not because it was worn out, but simply because the neighborhood had changed.

As a professional occupier of residential houses, it seems to me that the greatest waste in connection with them is not the 53 per cent construction waste which you note but the 100 per cent waste when the house soon becomes "out of style" and unsuited to its neighborhood.

Do you remember when rising fuel costs abolished the 10-ft. ceiling; when the maid scarcity wiped out the old dungeon and made the maid's room a palace with private bath; when the garage, the two-car garage and the heated garage successively revolutionized the old homestead; when the sun porch came in; when one bath became insufficient for an eight-room house; when the fireplace became mandatory and when the oil burner made the cellar a pool room? Where are the parlor, the hall, the vestibule, the den, the sewing room, the great closets and attics where the voluminous duds of yesteryear were stored?

As I look back at housing changes, it seems to me that what we need is not a steel house, but a rubber one.

Instead of trying to make an everlasting house, you had better devote your thoughts to a house which in fifteen years will automatically evaporate into thin air so that, if there be no salvage, at least there will be no cost of removing it to make way for the new construction the new type of neighborhood will then demand; a house so completely combustible that it will be a sure bet that fire, the greatest modernizing and civilizing agent we have, will remove it by the time its *useful* life is done and thus make way for the better type that will then be in demand. Far from decrying fire loss as our national scandal, it has made us the best housed nation in the world and should be encouraged. I was billeted in everlasting stone French houses during the war and I know what I am talking about.

Or, give us a house made of assembled units so readily

detachable that removal will be easy and salvage high, the units being capable of reassembly in different combinations at some other location, and at a profit. In this way, the De Puyster's 16-room mansion with one bath will become, as the neighborhood deteriorates, the Jones' eight-room and one-bath dwelling and finally the Pouvackowicz six-room, no bath and 30-occupants flop house.

Then, when the glue factory moves in, the railroad abandons its service, the ornamental trees die, the dead-end street is cut through to interstate traffic, the bus lines are rerouted, the schools are flooded with "underprivileged" from the opposite side of town, the "furriners" invade our block, the local politicians juggle the zoning act, the looters run taxes to \$86 a thousand, the apartment builders cut off our light, the street wideners take our front lawn, or any of the other manifold calamities of the home owner materialize, we can trade in the units of our house for a new bunch, take our licking on the plot and flee again to some yet unspoiled spot.

The American has got to move every five years and if the builder doesn't allow for the fact, he is headed up the creek.

New York.

ALFRED W. MILLER.

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Chemical Composition of Ingot Molds

(Concluded from page 437)

items are taken into consideration. Hence, a judicious survey of local price conditions should always govern the decisions pertaining to the selection of appropriate and economical mold metals.

Ingot molds, made from cast steel and containing chromium in limited amounts, do not show the beneficial influence of the alloy like gray iron—presumably due to the different rôle of the alloy in gray iron and steel in connection with its influence on carbon.

Tungsten

A few years ago, at a time when the introduction of so-called heat-resisting cast iron and cast steel was the vogue, trials were made with additions of tungsten to gray iron. While the metallurgical results warranted further investigations, the economic outlook of the work did not coincide with the expectations.

Conclusions

AFTER scrutinizing the statements made in the previous paragraphs, it appears that a thorough revision of the prevailing mold conditions in many a steel plant would warrant increased manufacturing economy and reduction of mold costs. In

Table II: Influence of Sulphur on the Durability of Ingot Molds

No. of Mold	Chemical Composition in per cent						Observed Life of Mold, Heats
	Total C	Si	Mn	P	S	Cr	
1	3.77	1.09	0.91	0.114	0.031	—	69
2	3.81	1.05	0.94	0.117	0.033	—	71
3	3.72	1.10	0.93	0.115	0.034	—	86
4	3.71	1.02	0.96	0.113	0.088	—	56
5	3.80	1.06	0.92	0.114	0.090	—	53
6	3.76	1.05	0.92	0.116	0.084	—	55

Table III: Comparative Properties of Plain and Chromium Mold Iron After 100 Heats of the Ingot Mold

Characteristics	Grade of Mold Metal	
	Plain Ingot Mold Iron, Per Cent	Alloyed Ingot Mold Iron, Per Cent
Average analysis: T.C	3.04	3.37
G.C	2.76	2.75
C.C	0.28	0.62
Si	2.07	1.98
Mn	1.21	1.18
P	0.122	0.113
S	0.060	0.052
Ni	nil	0.06
Cr	nil	0.78
Ti	0.02	0.01
Transverse strength:		
Breaking load, lb. per sq. in.	2470	3865
Deflection, in.	0.115	0.134
Average hardness:		
Brinell	112	223
Rockwell	B— 63.4	B— 96.3
Appearance of fracture:		
Grain	Coarse	Fine
Color	Dull gray	Light gray

order to bring favorable returns, however, such surveys should take into consideration all the known factors affecting the ultimate durability of the mold. Thus, each of the chemical elements present in the mold metal should be taken into account as to its direct or indirect influence on the life as well as the cost of the ingot mold in service. It is hoped that the present report will prove to be of suggestive value to those executives whose vision and earnest endeavor realize the contemporary status of the ingot mold in the production of high-grade steels at the most favorable manufacturing expenditures.



Scum Caused by Aluminum in Hot-Dipped Zinc Coatings

(Concluded from page 433)

is drawn out with the coating and in many cases sticks to the rims, or other parts of the work.

A typical example of this scum is seen in the illustration, where it has been drawn out with the coating near the rim of an ordinary light water pail. It is, however, not confined to any one kind of galvanizing. It will make pipe very rough, chill up the bath and make it very sticky. And when it is scraped off the work, the bare steel many times is found underneath.

Aluminum is added to the bath primarily to brighten up the coating and keep down surface oxidation of the bath. But it also does many other things not so well known or understood. The control of aluminum in the bath is not an easy matter, especially if the temperature of the bath is varied to any great extent. The bath will take up and hold a far larger amount of aluminum at low temperatures than it will at high temperatures.

Hence, if the bath is being operated at 830 to 840 deg. F. and then the temperature is raised to 870 to

880 deg. F., a shortage of aluminum will develop. This is due to the fact that the aluminum in the bath oxidizes much faster at the higher temperature than at the lower, hence more aluminum must be used.

On the other hand, suppose the conditions are reversed and the temperature is lowered instead of being raised. Then if the aluminum additions are not cut down an excess of aluminum in the bath will develop. The result will be to form excessive zinc ashes, cause scum on the bath, and to give a coating with this scum, scruf and dirt in it.

Scum Prevents Getting Adequate Protection

From the corrosion standpoint this scum in the coating is a great disadvantage, since bare or exposed steel may often be found beneath it when the scruf is removed with a file. The condition of the bath may be returned to normal by boiling it with a pine pole if too much aluminum has not been added. Poling the bath will boil out and oxidize and bring to the surface large quantities of these oxides and non-metallic particles, and the bath will be cleared again if too heavy additions of aluminum have not been made. A very small addition of good, pure Straits tin will take up, and alloy with, some of this aluminum, also.

All galvanizing baths produce more or less oxide on the surface, unless the procedure is to use a molten flux. In this case, of course, any small amount of oxide formed is taken up and held in the molten flux. On the other hand, even with normal amount of aluminum in the bath, scum may be drawn out with the coating if skimming is done carelessly. In all fields where the surface of the bath is entirely exposed to the air, or only partially exposed, this scum forms. It must be pushed back carefully when the articles are withdrawn from the bath.

To get rid of an excess scum may in some cases require a change of temperature of the bath. In others a little tin may be added to the bath to overcome it. In still others the scum is just due to carelessness of the operators in failing to have the surface well skimmed when the articles are withdrawn.

The actual quantity of aluminum that can be added to a galvanizing bath varies considerably. In some cases, where a very light deposit is required, it is not desirable practice to add any, or at most only an extremely small amount. In other cases, such as sheet galvanizing and baths for large bridge suspension cables, no aluminum at all is added. In sheet baths some tin is added, but in baths for large cables the metal is kept as pure as possible. In still other cases, such as metalware, where a beautiful, spangle finish is desired, aluminum may be added to the bath in large quantities.

Quantity of Additions Varies with Cases

It is seen at once that the purpose of the coating influences the metal additions made to the galvanizing bath. When other metal additions such as tin, antimony, etc., have been put in, the bath will carry larger amounts of aluminum also, without forming excessive quantities of oxide skimmings. It is, however, very difficult to operate a bath with heavy metal additions, for they get out of proportion and such troubles as "tin yellow," flux troubles, etc., develop.

In some cases this trouble can be most serious.

In one instance very high additions of aluminum caused so much flux trouble that a large portion of the bath had to be dipped out before operations could be continued. It is well to carry out some experiments cautiously, to note the effect of aluminum additions, rather than to place this matter in the hands of an unskilled operator.

High aluminum additions in a bath already high in iron may cause the bath to become very sticky and sluggish. The work will come out rough, and the bath will appear cold. To get such a bath back to normal again, the pot should first be drossed carefully and the proper amount of new zinc added.

This will have the tendency to reduce greatly the amount of aluminum in the bath if no fresh amounts are added. The bath can then be poled to boil out any excess still remaining. If there is no objection, a very small amount of tin may be added to thin out the metal and make it more fluid. Great care, however, should be taken in making tin additions to a galvanizing bath, and only an experienced operator may be allowed to make these changes.

The amount of aluminum added to the bath may be affected also by the surface area of the material galvanized. It can be seen at once that articles with a small surface area, but large weight, will use up only a small amount of metal in proportion to the total tonnage galvanized. On the other hand, in such work as sheets in the form of metalware, there is a very large surface area in proportion to the weight. Hence this kind of a bath may require considerably more aluminum.

Scum Affects Adhesion of Zinc to Base

The scum as shown in the illustration has a tendency to dry up the bath, and make it less fluid. This in turn has its direct effect in the way the zinc sticks or adheres to the base. Since the metal is very dry, it shows a tendency to be brittle. Hence this kind of metal, placed on any article that is to be bent, or to receive hard knocks, will peel and flake off much easier and quicker than from a bath of good zinc. The fluidity reduction also requires a much higher operating temperature of the bath to obtain the same results, and even then the coating is bound to be inferior to that from metal in good condition.

The density of the coating is affected when this scum is present in large quantities. In many cases the oxide and dirt may be seen embedded right in the coating, whence it can be dug out with a knife point. Below, the base metal can be seen and at this spot the coating has not properly adhered to the steel. This, of course, affects the corrosion-resisting properties of the coating.

One of the most noticeable effects of too high aluminum or alloy additions to the bath is seen in the large amount of oxide skimmings produced. These may reach a staggering proportion if the cause of their excessive amount is not known. In addition, since all ashes and scum on the bath carry zinc alloyed with the shot, high metal losses may occur from this same cause.

Another feature which has only been touched on briefly is the effect of this scum on the spangle or finish to the coating. Small amounts of aluminum

tend to keep the finish very bright, and develop a good spangle. On the other hand, a very high amount of oxide, scum, scurf and dirt in the bath tends to cloud the spangle, hinder its formation, and make the coating very dull and unsightly.

This can be readily seen in the coating in the illustration. When appearance is the principal feature of sales this defect, therefore, has a very large cash value. The finish is unsightly and may actually retard sales to a marked extent, even if the trouble is not bad enough to affect seriously the quality of the coating.

For Best Results the Bath Must Be Fluid

On work that is done in large lots, or a number of articles at one time, excess aluminum may cause the metal to become sticky, thereby making the work rough. This may happen with pipe, or with any other kind of work where a number of articles are withdrawn at one time. To give a good coating the metal must be very thin, and must not freeze quickly. The roughness is caused by the fact that, due to the high aluminum, the metal tends to freeze quickly after the work has come out of the bath. This may be before time has lapsed to separate the articles.

Then, when they are separated, the metal is so cold that it is sticky and the coating is therefore rough and ragged. Usually at this time a large amount of this scum is present, and it is of course dragged out with the coating. Some of it will be removed, but it is impossible to keep it all out of the coating.

It is impossible to say at what point of saturation this scum and scurf will appear. This is due to the fact that the amount of aluminum free to be oxidized varies with the iron content and temperature of the bath and the other metals in it. Bablik discusses a bath with 0.63 per cent aluminum in it, but this quantity is much higher than any that the writer is familiar with. Baths have been encountered with a very high aluminum content, but the operators were in great difficulty.

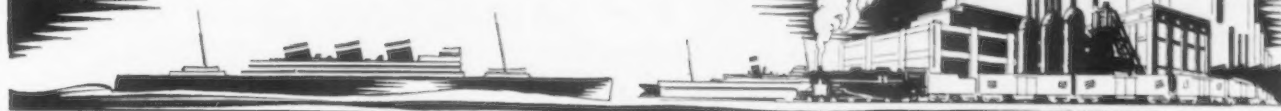
Alloying Action Affected by Aluminum Additions

Another factor of importance is that, as the aluminum content of the bath increases, the alloying action for the iron in the base becomes weaker. This may account for the fact that, in addition to the scum and scurf present with very high aluminum, there is also the tendency toward peeling and flaking of the coating.

The most satisfactory way of eliminating scum from the coating is to avoid setting up conditions that will produce it. Many other bad factors are present when this condition exists, so that a careful study of the use of aluminum, and commercial metals offered to brighten the coating and give a better spangle, should be made.

When it does appear in such quantities as will give a coating with scum, then the quickest way to eliminate the condition is: Dross the pot as soon as possible; put in new zinc; cut down or stop entirely, at least for a short period, the additions of aluminum or commercial alloy added to the bath; and then add the aluminum or alloy cautiously and in smaller amounts.

MARKETS



Offsetting Influences Leave Steel Output Unchanged

THE iron and steel industry presents a confused picture because of mixed tendencies in production and irregularities in the flow of specifications. Line pipe releases have increased, demands on the mills for structural steel and reinforcing bars are holding up and railroad demand appears to have passed its low ebb, but specifications for sheets and tin plate are still tapering.

Losses and gains, however, virtually counterbalance, and total raw steel requirements remain substantially unchanged. Slight increases in steel ingot output were made at Pittsburgh and Youngstown and declines were reported in the Wheeling district and at Cleveland, but the average for the country at large is estimated at 30 per cent, the same rate as a week ago.

WHETHER or not steel production has actually reached its lowest point, as now seems to be indicated, it is clear that several important market factors point to an upturn in the near future. "Vacation" suspensions by manufacturing consumers of iron and steel will terminate during the current month. The automobile industry, now at a low rate of activity, must issue specifications this month if there are to be increased operations in September. Some measure of improvement in motor car production is foreshadowed by greater activity in the die departments of plants making automobile stampings. There are also indications that the automobile makers themselves have underestimated the volume of retail demand. Latest reports for July show an output of 221,000 cars, against a previous estimate of 200,000 units, and August assemblies are now expected to run as high as 175,000 cars, whereas the general forecast only a week ago was 160,000 cars. The shutdown at the Ford Rouge plant, it now develops, is by no means complete, since 45,000 men have been retained in the manufacturing divisions and will produce parts for 100,000 cars before the end of September.

MANUFACTURERS of radios, refrigerators, radiators and steel barrels and drums are beginning to take more material and it is only a matter of time when the farm equipment industry will increase its specifications.

The Pittsburgh rail mill has resumed operations at a 25 per cent rate after a fortnight's suspension and is unlikely to be forced to shut down again this

▲ ▲ ▲
AVERAGE Steel Ingot Production Still 30 Per Cent
—Pipe Line Tonnage and Structural Work are Sustaining Factors
▼ ▼ ▼

year, since fall buying will soon get under way. At Chicago, where an interruption in rail output has been avoided, releases have also shown an increase. New rail business is confined to 2500 tons placed by the Texas & Pacific with the Colorado mill. However, the Louisville & Nashville is expected to take action on its inquiry for 50,000 tons within the next fortnight, and the Southern Pacific has come into the market for 60,000 tons. Prospective export orders which may be placed with American mills include 15,000 tons for Argentina and 12,000 tons for South Africa.

MORE than 160,000 tons of structural steel will be required for five large projects which will soon be placed. The bids on one of them, the Chicago Post Office, requiring 45,000 tons, have just been taken. The others are a bridge at New Orleans, 60,000 tons; a parcel post building, New York, 20,000 tons; an inland water terminal, New York, 20,000 tons; and a freight terminal and elevated structure in New York for the New York Central, 21,500 tons.

Steel pipe bookings have been augmented by the placing of 27,000 tons of 12¾-in. for a 207-mile oil line for the Texas Empire Pipe Line Co.

A total of 25,000 tons of plates and shapes will be required for six ocean vessels on which bids have been taken under the provisions of the Jones-White act. Four of them are for the American Diamond Lines and two for the Barber Line.

The decline of 74,507 tons in the unfilled tonnage of the Steel Corporation in July was surprisingly small in view of the sharp recession in business early in that month.

PPRICE developments are also favorable so far as finished steel is concerned. Wire nails now seem to be established at \$1.90 a keg, Pittsburgh, or \$2 a ton above the previous price. Sheet and strip prices are holding, and plates, shapes and bars are steady in most markets.

Foundry pig iron has declined 25c. a ton to \$16, furnace, in eastern Pennsylvania, and heavy melting steel has dropped 50c. a ton at Chicago. Domestic fluorspar is off \$1 a ton to \$13, mines.

THE IRON AGE composite prices of pig iron and steel scrap have declined slightly, the former from \$15.54 to \$15.50 and the latter from \$9.42 to \$9.25 a ton. The finished steel composite is unchanged.

PITTSBURGH

Steel Orders Show No Expansion— Plant Operations Are Variable

▲ ▲ ▲

Steel releases show further contraction thus far in August.

* * *

Steel ingot rate slightly higher at Pittsburgh and Youngstown, but lower at Wheeling.

* * *

Steel prices well maintained. Recent advance on merchant wire products seems to be established.

* * *

Scrap prices holding, except for blast furnace grades.

▼ ▼ ▼

PITTSBURGH, Aug. 11.—New buying of finished steel products during the first week of the new month seems to have been at a somewhat lower rate than prevailed during June and July, and releases against contracts showed further contraction. The effect of this on the market has not been favorable as steel producers had begun to feel that minimum demand had been reached during July.

Many of the larger outlets for steel products are temporarily checked because of vacation suspensions, and such manufacturing consumers as are operating are confining their releases to unusually small tonnages. The heavy building industry alone seems to be maintaining its requirements, as shipments of reinforcing bars and structural steel show no further contraction. Pipe is also moving to oil and gas lines in good volume, and Pittsburgh and Valley mills shared in an order for 27,000 tons of line pipe placed recently by the Texas Corp'n. No other large line pipe projects are reported, but producers still have some tonnage to work on, and seamless and electric weld mills are running at a much higher rate than the average for the industry as a whole.

Steel ingot operations in the Pittsburgh district have advanced slightly owing to resumption of production in a limited way at a large plant which had been closed for the last two weeks. This increase is offset by suspension of open-hearth activity at a smaller independent plant in the district, but the general average is slightly higher at 30 per cent of capacity. On the other hand, ingot output has been curtailed sharply in the Wheeling district, where the two leading producers have reduced their raw steel schedules. The average in that district is not above 45 per cent, compared with a rate of 55 to 60 per cent in recent weeks. Open-hearth activity in the Valleys is higher than it was a week ago, averaging about 37 per cent. This rate is not expected to be maintained for more than a few days. Finishing mills are averaging about the same as they had been, although sheet and tin plate production are both a bit lower.

Steel prices are still well maintained, and merchant wire products seem to be established at the higher levels announced about a month ago, if current buying is taken as a criterion. Weakness persists in bolts and nuts, but sheets and strip steel are well held and the tendency to-

ward shading on the heavy hot-rolled products is less pronounced.

Scrap prices are holding their own and, judging from the bids made on the recent railroad lists, the current market on No. 1 heavy melting steel is still quotable at \$10.50 to \$11. The other grades are also being well maintained. Buying of pig iron is duller than it was last month, and shipments are off slightly. Coal and coke are very quiet.

PIG IRON

Sales this month show a considerable falling off from those of July, and shipments also are lighter. The Elliott Co., Jeannette, Pa., is reported to have closed against its recent inquiry for a small tonnage of three grades of iron. Most of the business went to a Valley furnace. Scarcely any inquiry is before the trade, and buying is confined to carloads. The prices quoted below are still representative of the market.

Prices per gross ton, f.o.b. Valley furnace:	
Basic	\$15.50 to \$16.00
Bessemer	17.00
Gray forge	16.50
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Low phos., copper free	26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	\$16.00 to \$16.50
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Bessemer	17.50

Freight rates to points in Pittsburgh district range from 63c. to \$1.13.

SEMI-FINISHED STEEL

Shipments are light and no new buying is reported. Quotations on billets, slabs and sheet bars are nominal at \$29, Pittsburgh or Youngstown. Occasional small lots of forging billets

are bringing \$35, and a few old contracts at \$36 remain. Wire rods are well maintained at \$35, Pittsburgh or Cleveland, but business is very dull.

RAILS AND TRACK SUPPLIES

Production at the local rail mill has been resumed this week following a fortnight's suspension. Although little business has accumulated, initial operations are at about 25 per cent of capacity. While little tonnage is in sight, it is not likely that production will have to be suspended entirely again this year, as fall buying will get under way in a comparatively short time. Specifications for track accessories are about the same, but shipments this month will likely fall under those of July.

BOLTS, NUTS AND RIVETS

With bolt and nut makers averaging less than 25 per cent of capacity in production, price shading is still prevalent, in some cases amounting to as much as an extra 10 per cent, in addition to the regular discounts of 73 and 10 per cent off list. Rivet prices are held much better, with small rivets quoted at 70, 10 and 5 per cent off list, and large rivets at \$2.75 a 100 lb., Pittsburgh.

BARs, PLATES AND SHAPES

Structural shapes and reinforcing bars are still the mainstay of the market in the heavy hot-rolled products. New inquiry is still coming out and shipments against old contracts are holding at about the rate which has prevailed for the last two months. Two small structural jobs in Pittsburgh will take nearly 1000 tons of shapes; 300 tons required for the Islam Grotto has been placed. Otherwise local projects are not numerous, but Pittsburgh mills are bidding on jobs over a wide territory and are drawing a fair share of tonnage. The plate market is very dull, although a little railroad car tonnage has been placed with local builders. Shipments to barge yards are holding up fairly well, but only one or two builders have any backlogs to speak of; the rest will soon complete present orders. Merchant bars are very quiet, and shipments on alloy material this month have fallen under low July levels.

Prices on bars, plates and shapes are well maintained at the 1.60c., Pittsburgh, minimum, which was named about a month ago. While occasional deviations are reported on structural steel and reinforcing bars when the

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous,
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Aug. 11, 1931	Aug. 4, 1931	July 14, 1931	Aug. 12, 1930
No. 2 fdy., Philadelphia.....	\$16.76	\$17.01	\$17.01	\$19.76
No. 2, Valley furnace.....	17.00	17.00	17.00	18.00
No. 2 Southern, Cin'ti.....	14.69	14.69	14.69	15.69
No. 2, Birmingham.....	12.00	12.00	12.00	14.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	17.50
Basic, del'd eastern Pa.....	16.75	16.75	16.75	18.75
Basic, Valley furnace.....	15.50	15.50	15.50	18.00
Valley Bessemer, del'd P'gh..	18.76	18.76	18.76	20.28
Malleable, Chicago*.....	17.50	17.50	17.50	17.50
Malleable, Valley.....	17.00	17.00	17.00	18.50
L. S. charcoal, Chicago.....	25.04	25.04	25.04	27.04
Ferromanganese, seab'd car- lots.....	†\$5.00	†\$5.00	†\$5.00	94.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Ferromanganese quotations adjusted to carload unit; larger quantities at discounts.

Rails, Billets, etc.,

Per Gross Ton:	Aug. 11, 1931	Aug. 4, 1931	July 14, 1931	Aug. 12, 1930
Rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	34.00	34.00	34.00	36.00
Re-rolling billets, Pittsburgh..	29.00	29.00	29.00	31.00
Sheet bars, Pittsburgh.....	29.00	29.00	29.00	31.00
Slabs, Pittsburgh.....	29.00	29.00	29.00	31.00
Forging billets, Pittsburgh..	35.00	35.00	35.00	36.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	36.00
Skelp. grvd. steel, P'gh, lb....	1.60	1.60	1.65	1.70

Finished Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.60	1.60	1.65	1.65
Bars, Chicago.....	1.70	1.70	1.70	1.75
Bars, Cleveland.....	1.65	1.65	1.65	1.75
Bars, New York.....	1.93	1.93	1.98	1.98
Tank plates, Pittsburgh.....	1.60	1.60	1.65	1.60
Tank plates, Chicago.....	1.70	1.70	1.70	1.75
Tank plates, New York.....	1.88	1.88	1.93	1.88
Structural shapes, Pittsburgh..	1.60	1.60	1.65	1.60
Structural shapes, Chicago..	1.70	1.70	1.70	1.75
Structural shapes, New York..	1.85 1/2	1.85 1/2	1.90 1/2	1.85 1/2
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh..	1.55	1.55	1.55	1.65
Cold-rolled strips, Pittsburgh	2.15	2.15	2.15	2.35

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel,

Per Lb. to Large Buyers:	Aug. 11, 1931	Aug. 4, 1931	July 14, 1931	Aug. 12, 1930
Hot-rolled annealed, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.45
Hot-rolled annealed sheets, No. 24, Chicago dist. mill....	2.50	2.50	2.50	2.55
Sheets, galv., No. 24, P'gh....	2.90	2.90	2.90	3.05
Sheets, galv., No. 24, Chicago dist. mill.....	3.00	3.00	3.00	3.20
Hot-rolled sheets, No. 10, P'gh.	1.70	1.70	1.70	1.70
Hot-rolled sheets, No. 10, Chi- cago dist. mill.....	1.80	1.80	1.80	1.80
Wire nails, Pittsburgh.....	1.90	1.80	1.80	2.05
Wire nails, Chicago dist. mill	1.95	1.85	1.85	2.10
Plain wire, Pittsburgh.....	2.20	2.20	2.20	2.30
Plain wire, Chicago dist. mill.	2.25	2.25	2.25	2.35
Barbed wire, galv., P'gh....	2.55	2.55	2.55	2.80
Barbed wire, galv., Chicago dist. mill.....	2.60	2.60	2.60	2.85
Tin plate, 100 lb. box, P'gh....	\$5.00	\$5.00	\$5.00	\$5.25

Old Material, Per Gross Ton:

Heavy melting steel, P'gh....	\$10.75	\$10.75	\$10.50	\$15.00
Heavy melting steel, Phila....	8.75	8.75	8.25	12.50
Heavy melting steel, Ch'go....	8.25	8.75	8.75	12.00
Carwheels, Chicago.....	10.00	10.00	10.00	13.50
Carwheels, Philadelphia.....	12.00	12.00	12.00	14.50
No. 1 cast, Pittsburgh.....	11.00	11.00	10.50	13.50
No. 1 cast, Philadelphia.....	11.50	11.50	11.50	13.00
No. 1 cast, Ch'go (net ton)...	9.00	9.00	9.00	12.00
No. 1 RR. wrot., Phila.....	10.00	10.00	10.00	15.00
No. 1 RR. wrot., Ch'go (net)	7.00	7.00	7.00	10.00

Coke, Connellsville,

Per Net Ton at Oven:	Aug. 11, 1931	Aug. 4, 1931	July 14, 1931	Aug. 12, 1930
Furnace coke, prompt.....	\$2.40	\$2.40	\$2.40	\$2.60
Foundry coke, prompt.....	3.50	3.50	3.50	3.50

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	8.12 1/2	8.12 1/2	8.12 1/2	11.12 1/2
Electrolytic copper, refinery..	7.25	7.50	7.50	10.75
Tin (Strait), New York.....	25.12 1/2	24.80	24.82 1/2	30.00
Zinc, East St. Louis.....	3.82 1/2	3.85	3.90	4.32 1/2
Zinc, New York.....	4.17 1/2	4.20	4.25	4.67 1/2
Lead, St. Louis.....	4.22 1/2	4.22 1/2	4.22 1/2	5.35
Lead, New York.....	4.40	4.40	4.40	5.50
Antimony (Asiatic), N. Y....	6.60	6.65	6.90	7.75

tonnage involved is exceptionally large, smaller projects are generally going at the full price.

COLD-FINISHED STEEL BARS

Production for the industry as a whole averages less than 25 per cent. Current specifications are extremely light. A few trial orders for new automobile models have been received, but no tonnage has been placed for such uses. The price is well maintained at 2.10c., Pittsburgh.

TUBULAR GOODS

A Pittsburgh district mill and two Youngstown mills have shared in the award of 27,000 tons of pipe for an oil-carrying line for the Texas Empire Pipe Line Co., jointly controlled by the Texas Corp'n. and the Cities Service Co. The line, 207 miles long, will be laid in the east Texas fields.

A pipe line in New York State, extending from the terminus of the recently placed Lycoming Natural Gas Co. line to eastern New York State points, is being considered, but

is not likely to come up for bids this year. No other active line pipe tonnage is in sight, although several less definite projects are before the trade. Demand for standard pipe is dull but steady, with butt-weld units running at about 25 per cent of capacity. Seamless and electric weld mills are doing much better, although they are not booked far in advance. Recent proration activity in the Oklahoma and east Texas fields has not affected the sale of oil country goods materially.

WIRE PRODUCTS

Makers are now generally adhering to \$1.90 a keg on current orders for wire nails, and the entire list of merchant wire product is somewhat stronger. Although some jobbers are covered for some time at lower prices, the retail trade is generally adhering to the higher quotations. Wire fencing is lower at \$55 a net ton for the No. 9 and 11 gage, but little new buying has appeared. Conditions in the agricultural sections are not conducive to much buying by farmers just

now, but some business will undoubtedly come out when harvesting is finished. Users of spring wire are doing little business and manufacturers' wire reflects the dullness in the automobile trade.

SHEETS

While new buying is still very limited, the price structure is well maintained. All important makers are reported to be quoting the schedules adopted on July 1. Shipments against old low-priced contracts have now been cleaned out, and the reception by consumers of the higher quotations is awaited with considerable interest. Thus far most of them have shown a willingness to buy at the new prices. Hot-rolled annealed sheets are quotable at 2.40c. a lb., Pittsburgh; ordinary hot-rolled at 1.70c.; galvanized at 2.90c., and auto body sheets at 3.10c. August is ordinarily a dull month for sheet makers, particularly when the automobile industry is running at a low rate. Specifications from electric refrigerator makers have gradually fallen off, but this loss has

THE IRON AGE COMPOSITE PRICES

Finished Steel		Pig Iron	Steel Scrap
Aug. 11, 1931	2.116c. a Lb.	\$15.50 a Gross Ton	\$9.25 a Gross Ton
One week ago	2.116c.	15.54	9.42
One month ago	2.137c.	15.56	9.17
One year ago	2.156c.	16.88	13.17
Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.		Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	
Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.			
HIGH LOW		HIGH LOW	HIGH LOW
1931.....	2.142c., Jan. 13: 2.102c., June 2	\$15.90, Jan. 6: \$15.54, July 21	\$11.33, Jan. 6: \$9.08, June 23
1930.....	2.362c., Jan. 7: 2.121c., Dec. 9	18.21, Jan. 7: 15.90, Dec. 16	15.00, Feb. 18: 11.25, Dec. 9
1929.....	2.412c., April 2: 2.362c., Oct. 29	18.71, May 14: 18.21, Dec. 17	17.58, Jan. 29: 14.08, Dec. 3
1928.....	2.391c., Dec. 11: 2.314c., Jan. 3	18.59, Nov. 27: 17.04, July 24	16.50, Dec. 31: 13.08, July 2
1927.....	2.453c., Jan. 4: 2.293c., Oct. 25	19.71, Jan. 4: 17.54, Nov. 1	15.25, Jan. 11: 13.08, Nov. 22
1926.....	2.453c., Jan. 5: 2.403c., May 18	21.54, Jan. 5: 19.46, July 13	17.25, Jan. 5: 14.00, June 1
1925.....	2.560c., Jan. 6: 2.396c., Aug. 18	22.50, Jan. 13: 18.96, July 7	20.83, Jan. 13: 15.08, May 5

been offset to some extent by the larger needs of radio manufacturers. Such concerns have stepped up their operations 10 to 15 per cent in the last week or two. Makers of steel barrels and drums are releasing steel at a fair rate in some territories, but the tonnage is spotty. Operations have dropped slightly from the 35 per cent rate which prevailed last week.

TIN PLATE

While recent declines in tin plate specifications have not been entirely checked, mills have adjusted their schedules with more care, and operations for the industry as a whole have fallen off only fractionally to slightly less than 55 per cent of capacity. The rate of incoming tonnage in the next few weeks will be governed largely by the tomato pack, which is beginning in some sections.

STRIP STEEL

Specifications continue at a low rate, with the first week of August falling somewhat below the July average. This was to be expected in view of the sharp curtailment of automobile production, and no substantial improvement can be expected until the larger motor car builders get back into production on new models. A few large parts makers are beginning to order material, but mostly in an experimental way. If automobile production is to rise very substantially during September, it will have to be reflected this month in the steel specifications of both assembling companies and parts makers. Production schedules compare with those of July, although some mills are less active. Prices seem to be well maintained at 1.55c. and 1.65c. on hot-rolled strip, and 2.15c. on cold-rolled. Shipments against lower-priced contracts have practically all been made.

COKE AND COAL

The market is unchanged, with prices on both furnace and foundry coke rather easy. The furnace grade is still quotable at \$2.40, Pittsburgh, while foundry coke is unchanged at

\$3.25 to \$3.50. No new developments in the coal industry are reported, and present quotations are entirely in line.

OLD MATERIAL

Bidding on the railroad scrap lists last week established the market at the levels which have prevailed for three weeks. The No. 1 heavy melting steel on the principal list is reported to have brought as high as \$11.25 for shipment to two mills in the Pittsburgh district, although one consumer of scrap is said to be picking up small lots of heavy melting steel at as low as \$10.50 when dealers are willing to sell tonnage at that figure. Some dealers are paying more than this to cover old contracts. The same condition is evident in rails and hydraulic compressed sheets. Blast furnace scrap is hardly so strong, a recent high-priced order having been practically covered. No changes are reported in the other grades, with

railroad specialties well maintained by dealer bidding in spite of the absence of consumer purchases.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel..	\$10.50 to \$11.00
No. 2 heavy melting steel..	9.50 to 10.00
Scrap rails	10.50 to 11.00
Compressed sheet steel....	10.25 to 10.75
Bundled sheets, sides and ends	8.50 to 9.00
Cast iron carwheels.....	10.50 to 11.00
Sheet bar crops, ordinary..	11.50 to 12.00
Heavy breakable cast.....	8.00 to 8.50
No. 2 railroad wrought....	10.50 to 11.00
Hvy. steel axle turnings....	9.50 to 10.00
Machine shop turnings....	7.00 to 7.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	12.75 to 13.25
Railr. coil and leaf springs	12.75 to 13.25
Roller steel wheels.....	12.75 to 13.25
Low phos. billet and bloom ends	14.50 to 15.00
Low phos. mill plates....	12.50 to 13.00
Low phos. light grades....	12.50 to 13.00
Low phos. sheet bar crops	13.00 to 13.50
Heavy steel axle turnings..	9.50 to 10.00
Electric Furnace Grades:	
Low phos. punchings....	13.50 to 14.00
Heavy steel axle turnings..	9.50 to 10.00
Blast Furnace Grades:	
Short shoveling steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings.....	7.50 to 8.00
Rolling Mill Grades:	
Steel car axles	16.50 to 17.50
Cupola Grades:	
No. 1 cast.....	10.50 to 11.50
Rails 3 ft. and under....	12.50 to 13.00

Switching Rates to be Higher in Chicago

The Interstate Commerce Commission has prescribed, effective Nov. 10, a revised basis of switching rates for the Chicago district. The order fixes 3c. per 100 lb. on one-line hauls; 3.50c. per 100 lb. for two-line hauls and 4c. per 100 lb. for three or more line-hauls. The carload minimum is 60,000 lb.

The new rates are designed to equalize charges between interstate and intrastate traffic movements and are somewhat higher than the present rates.

Warehouse Prices, f.o.b. Pittsburgh

*Base per Lb.	
Plates	2.85c.
Structural shapes.....	2.85c.
Soft steel bars and small shapes...	2.60c.
Reinforcing steel bars.....	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons.....	3.10c.
Squares and flats.....	3.60c.
Bands	2.95c.
Hoops	3.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles.....	3.05c.
Galv. sheets (No. 24), 25 or more bundles	3.40c.
Hot-rolled sheets (No. 10).....	3.15c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.).....	3.74c.
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Boat	3.00c.
Track bolts, all sizes, per 100 count, 70 and 10 per cent off list	
Machine bolts, 100 count, 70 and 10 per cent off list	
Carriage bolts, 100 count, 70 and 10 per cent off list	
Nuts, all styles, 100 count, 70 and 10 per cent off list	
Large rivets, base per 100 lb.....	\$3.20
Wire, black, soft ann'd, base per 100 lb.....	2.30
Wire, galv. soft, base per 100 lb.....	2.75
Common wire nails, per keg.....	2.05
Cement coated nails, per keg.....	2.05

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 999 lb.

CHICAGO

Ingot Production Expected to Expand Slightly This Week

CHICAGO, Aug. 11.—An upward turn in demand for iron and steel in this district appears to be near at hand. The week is being started with ingot production at 30 per cent of capacity, but some open-hearths are being lighted and a gain seems assured in the very near future.

New buying of finished steel products is showing little variation, but specifications are growing slightly heavier and the outlook for further expansion is promising. A pipe mill that has been down for about 10 days has resumed operations, and structural fabricators are taking steel at a more rapid rate. A pressed metal plant to the south is operating at capacity and a farm implement plant in Wisconsin has materially increased its schedule. Other farm machinery builders acknowledge that machinery warehouses are well drained, and production schedules are being planned for September.

Once again there is a noticeable undercurrent in the railroad equipment market, with reports being circulated that potential inquiries by Western railroads already total over 5000 cars.

Substantial quantities of steel are moving from this district to certain Chrysler automobile plants. Stove manufacturers in western Michigan are melting more pig iron. The movement to scrap old railroad equipment is gaining headway and, in the meantime, the carriers are drawing more heavily against mills, especially for steel to be used in maintenance-of-way programs.

On the less favorable side of the market is a break of 50c. a ton in scrap, but if ingot production starts on an upward path this situation may soon be rectified. Steel mill blast furnace output is somewhat curtailed for the reason that the Joliet stack, which is a link in the production of Bessemer rods for wire mill use, is being banked in alternate weeks.

FERROALLOYS

This market is very dull, particularly as it is affected by the steel foundry industry, which is operating at a low rate. A more rapid movement of these commodities may be expected if ingot production is stepped up, as is now promised. A mixed cargo of spiegeleisen and low phosphorus pig iron is due to arrive at a Chicago dock.

PIG IRON

Several substantial tonnages of Northern iron have been placed for delivery during the remainder of the year and a sufficient number of new inquiries are out to give the impression that not only is buying making headway but will soon gain momen-

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With steel ingot output now at 30 per cent, a rise is expected this week and possibly next.

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Resumption of manufacturing by a leading pipe maker adds to plate mill specifications.

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Farm equipment manufacturers expected to swing into larger schedules in September.

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Potential railroad inquiry totals 5000 cars.

* * *

Unfavorable development is a break in scrap prices.

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tum. Shipments are a trifle heavier, especially to stove manufacturers. The silvery market is quiet following sales of about 500 tons of the metal salvaged from a boat which had run aground. The charcoal iron market is quiet, with only one furnace in blast.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	\$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	\$25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos., sil. 1 to 2, copper free	28.50 to 29.20
Silvery, sil. 8 per cent	24.79 to 26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including an average switching charge of 61c. per gross ton.

CAST IRON PIPE

Prices near \$28 a ton, Birmingham, have been named on 6-in. and larger diameters in this district, and still lower quotations are said to have been made in Ohio. Barberton, Ohio, has placed 1300 tons of 24-in. Class B pipe at a figure well below the recent market. Glencoe, Ill., has taken 200 tons of 16-in. pipe at \$30 a ton, Birmingham, or \$38, delivered. This is a reduction of about \$4 a ton from the market as it has stood in recent weeks. It is now disclosed that the 1100 tons of 6 to 12-in. pipe ordered a week ago by Fox Point, Wis., was placed at \$36.75, delivered, or \$28.35 a ton, Birmingham. This tonnage is to be furnished by an Eastern producer, which in the past has reached Lake Shore towns by boat. United

States Pipe & Foundry Co. has taken 600 tons of 6 to 20-in. pipe for delivery to a Madison, Wis., sewage plant. Transactions, though somewhat more numerous, are based largely on old inquiries. Fresh requests for prices are very scarce.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$12 to \$44; 4-in., \$15 to \$47; Class A and gas pipe, \$3 extra.

WAREHOUSE BUSINESS

Orders are creeping forward slowly, with the result that the first part of August is showing improvement over the last 10 days or so in July. The change is not large, but it reflects a seasonal improvement expected at this time of year. The real test is looked for in September, which is usually one of the best months in the year. Prices are steady.

WIRE PRODUCTS

Although there is a slight improvement in this market, the change is very small when compared with the usual seasonal swing in August. There is little or no change in the use of wire by the manufacturing trade. Jobbers and dealers are cautious in placing orders for stock replenishment. Producers have made no adjustment in rate of operations, which stand in the range from 25 to 30 per cent of capacity. Prices are holding in a market where individual purchases are small and frequent and therefore offer little in the way of real tests.

COLD-ROLLED STRIP

Orders for this commodity are scattered and do not support output above 18 per cent of capacity. Prices are holding well at 2.15c. a lb., Cleveland.

RAILS AND TRACK SUPPLIES

The Texas & Pacific has ordered 2500 tons of rails and 500 tons of tie plates from the Colorado Fuel & Iron Co. New buying is sluggish in the local market, but releases are slightly heavier and there is some promise that shipments will grow in the next few weeks. In fact, a number of railroads are disposed to draw out old commitments, though no moves are being made to consider requirements for the coming year. Local rail mills, though operating throughout the summer at low output, have not experienced a shutdown, which often occurs when winter and spring shipments are much heavier in proportion to bookings than they have been this year. Releases of track fastenings are holding recent gains, but new purchases are light.

SHEETS

Prices are steady, but sales remain light and individually small, with the

result that a real test is lacking. It is quite evident, however, that tests are near at hand because several large consumers are showing interest in the market, and there is excellent prospect that several sizable tonnages will come before the trade at a very early date. One of these is 4500 tons of sheets for steel barrels. Few favorable seasonal influences are now working in this market and where they have made their appearance they are so slight that they have not left much of an imprint. Output at hot mills remains in the range from 35 to 40 per cent of capacity.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.40c. to 2.50c.; No. 24 galv., 2.95c. to 3.05c.; No. 10 blue ann'd, 2.00c. to 2.10c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

STRUCTURAL MATERIAL

Both awards and inquiries are more promising. New contracts total 9000 tons, of which 7500 tons is for a transmission line from Peoria, Ill., to Chicago. Fresh inquiries, at about 11,000 tons, are almost wholly for public work. Bids were opened Monday on the new Post Office. John Griffiths & Son Co., Chicago, is low bidder on the general contract. The successful bidder on the 45,000 tons of structural steel will be made known soon. Small inquiries and lettings are again increasing. Shipments from mills have gained appreciably in the last week or 10 days.

BOLTS, NUTS AND RIVETS

Prices of these commodities still remain weak and variable in a market which affords little in the way of spot purchases. There has been some improvement in specifications from manufacturers of farm equipment, and the outlook for additional growth in this direction is promising.

PLATES

This commodity seems once again to be headed for leadership in building up a higher rate of ingot production. A pipe maker in this district has received releases and has resumed operations on a substantial scale after having been idle since about the first of the month. Skelp shipments have already been increased and the schedule for next week promises that more open-hearths will be brought into service. About 4000 tons of steel will be needed for 500 box cars and superstructure sets to be fabricated in this district. One Western railroad is quietly asking for prices on 100 cars, but it is understood that a purchase of 1200 cars is contemplated. Several other railroads are a step nearer car buying, with the net result that this phase of the steel market looks considerably more promising. The Chicago & North Western contemplates scrapping 9000 cars, which is taken in steel circles as proof that much rolling stock now counted as active is in reality obsolete and fit only for the scrap pile. The tank

market has mustered only 300 tons in orders and is lacking in inquiries.

REINFORCING BARS

Demand remains very light, with the bulk of transactions in lots up to 25 tons each. There are few large pending projects, but conditions are such that they are very slow in reaching the closing stage. Competition is keen and prices are weak. Rail steel bars for building purposes are selling at as low as 1.35c. a lb., warehouse, and the billet steel product is showing like weakness. The rail steel and rail equivalent phase of the market promises to be clarified somewhat by a recent action by rail equivalent sellers to place carbon limits between 50 and 90. Heretofore the limits have been from 35 to 50 points. Mills and warehouses alike are bemoaning the loss of immediate tonnage because of the Illinois labor law that has retarded public work.

BARs

Orders are scattered and shipments are unchanged in volume, while prices are subject to variation on a few transactions. A hopeful sign is that warehoused farm machinery has gradually been passing to the hands of users and some warehouses have reached the point where production is imperative. Several farm implement manufacturers are reported to have said that they are deliberately holding back production at this time in order to spread employment further into the winter and thereby assist the communities in which they are located through the most difficult part of the year. Here and there a small manufacturer making a seasonal product is operating at close to capacity.

COKE

Spot buying of this commodity is very quiet, but prices are holding at

\$7.50 a ton, local ovens. Shipments remain light, though they have increased moderately in several directions.

OLD MATERIAL

Prices for heavy melting and some other open-hearth grades have declined under the pressure of accumulating supplies and curtailed use. Heavy melting is off 50c. a ton on sales to consumers. Dealers are now finding tonnages freer at offers of \$8 than they did when it was necessary for them to pay \$8.50. About 4000 tons of cast iron borings are being accumulated for the second movement by boat to Lake Erie mills. It is planned to make this shipment in September. Reports that heavy melting steel will be moved by water from Chicago cannot be verified. Taken as a whole, this market presents a far less optimistic aspect than it did earlier in the month.

Prices del'd Chicago dist. consumers:
Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel.....	\$8.00 to \$8.50
Shoveling steel	8.00 to 8.50
Frogs, switches and guards, cut apart, and misc. rails	8.00 to 8.50
Factory hyd. comp. sheets	6.50 to 7.00
Drop forge flashings.....	6.00 to 6.50
No. 1 busheling	6.75 to 7.25
Forg'd cast and r'd steel carwheels	8.50 to 9.50
Railroad tires, charg. box size	10.50 to 11.00
Railroad leaf springs cut apart	10.50 to 11.00
Axle turnings	7.00 to 7.50
Acid Open-Hearth Grades:	
Steel couplers and knuckles	9.50 to 10.00
Coil springs	11.00 to 11.50
Electric Furnace Grades:	
Axle turnings	7.50 to 8.00
Low phos. punchings.....	11.00 to 11.50
Low phos. plates, 12 in. and under	10.50 to 11.00
Blast Furnace Grades:	
Cast iron borings.....	3.75 to 4.25
Short shoveling turnings..	3.75 to 4.25
Machine shop turnings....	3.75 to 4.25
Rolling Mill Grades:	
Rerolling rails	10.00 to 10.50
Cupola Grades:	
Steel rails, less than 3 ft..	10.25 to 10.75
Steel rails, less than 2 ft..	11.00 to 11.50
Angle bars, steel.....	9.25 to 9.75
Cast iron carwheels.....	10.00 to 10.50
Malleable Grades:	
Railroad	8.50 to 9.00
Agricultural	8.25 to 8.75
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	19.00 to 21.00
*Relaying rails, 65 lb. and heavier	22.00 to 27.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars.	8.50 to 9.00
Iron arch bars and transoms	10.50 to 11.00
Iron car axles	17.50 to 18.50
Steel car axles	12.00 to 12.50
No. 1 railroad wrought...	7.00 to 7.50
No. 2 railroad wrought...	7.00 to 7.50
No. 1 busheling.....	5.50 to 6.00
No. 2 busheling.....	4.00 to 4.50
Locomotive tires, smooth..	11.50 to 12.50
Pipes and flues.....	5.50 to 6.00
Cupola Grades:	
No. 1 machinery cast....	9.00 to 9.50
No. 1 railroad cast.....	8.00 to 8.50
No. 1 agricultural cast....	7.00 to 7.50
Stove plate	6.25 to 6.75
Grate bars	5.50 to 6.00
Brake shoes	5.75 to 6.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

Base per Lb.	
Plates and structural shapes.....	3.00c.
Soft steel bars.....	2.75c.
Reinforcing bars, billet steel.....	1.55c. to 2.00c.
Rail steel reinforcement—	
For buildings	1.35c. to 1.65c.
Highway slabs	1.50c.
For bridges and culverts.....	1.65c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.10c.
Flats and squares	3.60c.
Bands, $\frac{7}{8}$ in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)...	3.50c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galv. sheets (No. 24).....	4.10c.
Hot-rolled sheets (No. 10).....	3.20c.
Spikes ($\frac{3}{4}$ in. and larger).....	3.45c.
Track bolts	4.30c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
Per Cent Off List	
Machine bolts	60, 10 and 10
Carriage bolts	60, 10 and 10
Coach and lag screws.....	60, 10 and 10
Hot-pressed nuts, sq. tap. or blank, 60, 10 and 10	
Hot-pressed nuts, hex., tap. or blank, 60, 10 and 10	
No. 8 black ann'd wire, per 100 lb..	\$3.45
Com. wire nails, base per keg.....	2.30
Cement c'd nails, base per keg....	2.30

CLEVELAND

Ingot Operating Rate for District Drops to 20 Per Cent

CLEVELAND, Aug. 11.—The volume of business in finished steel has shown no change the past week. Orders this month are holding at about the level of July except in sheets and strip steel, which have continued to decline with the further retrenchment of operations by the motor car industry.

Steel plant operations in Cleveland dropped three points during the week by the taking off of another open-hearth furnace, leaving only seven out of 34 running, or 20 per cent of ingot capacity. Local sheet and strip mills are idle.

Of the heavier rolled steel products, structural shapes are the most active due to the release of specifications against jobs placed earlier in the summer. However, no new building work of any size is pending.

A few miscellaneous orders came during the week from railroads which recently had been ordering virtually no steel. All purchasing by the Erie Railroad hereafter will be done in this city, to which the executive offices have been removed from New York.

A slight gain in steel tonnage is looked for toward the end of the month. The resumption of operations by some metal-working plants now shut down, the probability of more activity by the motor car industry next month and the belief that the approach of fall will offer a little stimulus to the demand for steel furnish a basis for this expectation. So far the only tangible evidence of an improvement is that die departments of some plants making automobile stampings have become fairly busy making dies for model changes in automobiles.

The only change in the price situation is the general recognition of a 1.65c. Cleveland price on steel bars for local delivery, or the same as the mill price for outside shipment. Regular prices on other products are being maintained.

IRON ORE

Dock balance at Lake Erie ports Aug. 1 was 5,365,693 tons, compared with 5,022,538 tons on the same date a year ago. Receipts at these docks during July were 3,191,156 tons and for the season 6,168,437 tons, against 16,097,792 tons during the corresponding period last year. Shipments from Lake Erie docks in July were 2,308,450 tons, and for the season 5,324,808 tons, against 12,460,629 tons up to Aug. 1 last year. Receipts at other than Lake Erie ports in July were 1,734,710 tons and for the season 3,924,450 tons, against 7,312,710 tons in the same period last year.

PIG IRON

Sales of foundry and malleable iron aggregating 9000 to 10,000 tons were reported during the past week by Cleveland interests and indicate some gain in activity. Shipping orders for August show a slight gain over those of July, the increase being due largely to releases from manufacturers of radiators and house-heating furnaces. Demand from the motor car industry still is tending downward. Few jobbing foundries in this territory are operating more than two days a week. The only sizable inquiry is from a southwestern Ohio melter for 300 tons of foundry iron. Prices are unchanged at \$16 to \$17, Lake furnace, for Ohio and Indiana, \$17 to \$17.50 for Michigan, and \$17, Cleveland, for local delivery.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25.....	\$17.00
S'th'n fdy., sil. 1.75 to 2.25.....	17.01
Malleable.....	17.50
Ohio silvery, 8 per cent.....	25.00
Stand. low phos., Valley.....	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; \$3 from Jackson, Ohio; \$6.01 from Birmingham.

SEMI-FINISHED STEEL

Demand has further receded because of the light operation of non-integrated sheet mills that serve the motor car industry. The price is unchanged at \$29, Cleveland and Youngstown, for sheet bars, billets and slabs.

BARs, PLATES AND SHAPES

The \$1 a ton reduction to 1.65c., Cleveland, on steel bars for local delivery made by a local mill has been adopted by some of the outside mills. The same price prevails for outside shipment. New billet steel reinforcing bars continue weak, with reports of quotations well under the regular 1.55c. price. Plates and shapes are

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes.....	2.95c.
Soft steel bars.....	2.75c.
Reinforc. steel bars.....	1.75c. to 1.95c.
Cold-fin. rounds and hex.....	3.10c.
Cold-fin. flats and sq.....	3.60c.
Hoops and bands, No. 12 to 14 in. inclusive.....	3.00c.
Hoops and bands, No. 13 and lighter.....	3.55c.
Cold-finished strip.....	*5.55c.
Hot-rolled annealed sheets (No. 24).....	3.60c.
Galvanized sheets (No. 24).....	4.00c.
Hot-rolled sheets (No. 10).....	3.00c.
No. 9 ann'd wire, per 100 lb.....	\$2.25
No. 9 galv. wire, per 100 lb.....	2.70
Com. wire nails, base per keg.....	2.10

*Net base, including boxing and cutting to length.

firm at 1.60c., Pittsburgh. Demand for heavy hot-rolled products generally is confined to small lots. There is no activity in the building field. Cleveland has placed a water pipe line requiring 2500 tons of plates.

SHEETS

While some carlot business is coming out at the new prices, the aggregate tonnage continues very light. Many consumers have enough stock on hand which was shipped against specifications placed before Aug. 1 at the old prices to last them through this month, and new orders from these buyers are expected to stimulate activity during the latter part of the month. There is more new demand in evidence from refrigerator and steel barrel industries than from other consumers. The new prices are being firmly maintained.

STRIP STEEL

Slowing down by some of the automotive accessory manufacturers has resulted in further decline in the demand for both hot and cold-rolled strip. On the small amount of hot-rolled strip that is coming out, the new prices of 1.55c., Pittsburgh, for wide and 1.65c. for narrow are being maintained. Cold-rolled strip is steady at 2.15c., Cleveland.

OLD MATERIAL

With local mills taking no scrap, activity is confined to a limited amount of buying by dealers for shipment to Youngstown district mills. For filling these outstanding orders, dealers are paying \$10.25 for No. 1 heavy melting and \$9 to \$9.25 for No. 2. Local prices are nominal.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel..	\$8.50 to \$9.00
No. 2 heavy melting steel..	8.00 to 8.50
Compressed sheet steel..	7.50 to 8.00
Light bundled sheet stampings.....	6.50 to 7.00
Drop forge flashings.....	6.75 to 7.00
Machine-shop turnings.....	5.00 to 5.50
Short shovelling turnings..	6.50 to 7.00
No. 1 railroad wrought....	9.50 to 10.00
No. 2 railroad wrought....	10.00 to 10.50
No. 1 bushelling.....	6.75 to 7.00
Pipes and flues.....	5.50 to 6.00
Steel axle turnings.....	7.50 to 8.00
Acid Open-Hearth Grades:	
Low phos., billet bloom and slab crops.....	14.00 to 14.50
Blast Furnace Grades:	
Cast iron borings.....	6.50 to 6.75
Mixed borings and short turnings.....	6.50 to 6.75
No. 2 bushelling.....	6.00 to 6.25
Cupola Grades:	
No. 1 cast.....	10.00 to 10.50
Railroad grate bars.....	6.00 to 6.50
Stove plate.....	6.00 to 6.50
Itals under 3 ft.....	15.00 to 15.50
Miscellaneous:	
Rails for rolling.....	13.00 to 13.50
Railroad malleable.....	11.00 to 11.25

NEW YORK

No Improvement in Demand for Pig Iron and Steel

NEW YORK, Aug. 11.—No appreciable change in demand for pig iron is evident. New inquiry is confined to a total of 1000 tons, including 300 tons of No. 1X and No. 2 plain for prompt delivery to the American Locomotive Co., Schenectady, N. Y. With large consumers in the district well covered by old contracts for the remainder of the year, little improvement in demand is anticipated before late fall. Shipping releases are reported to be more numerous, but specifications generally cover only car lots. Sales for the week amounted to 4200 tons, compared with 3900 tons the previous week, and 3200 tons two weeks ago. The Crane Co., Bridgeport, Conn., is reported to have purchased foundry iron for delivery this month.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25.....	\$19.41 to \$19.91
*Buff. No. 2, del'd east.	
N. J.	17.78 to 18.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	17.39 to 17.89
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.....	17.89 to 18.39

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

FINISHED STEEL

Orders for various steel products thus far in August have been coming in at approximately the low rate of July. No improvement is discernible in any line, nor are there any indications yet of the expected upturn next month. Consumers are carefully avoiding the building up of stocks.

The stability of prices is particularly noticeable considering the dearth of business. Sales of sheets are being made in small lots at the new prices, there being no hint of weakness anywhere in the sheet schedule. Bars, plates and shapes are steady at 1.60c. a lb., Pittsburgh, or 1.70c., f.o.b. Eastern mills for plates and shapes.

CAST IRON PIPE

Featuring awards the past week was that of 2400 tons of 4 to 12-in. pipe to the Warren Foundry & Pipe Corp., by the townships of Parsippany and Troy Hills, N. J. Richburg, N. Y., placed 500 tons of 6 and 8-in. with the United States Pipe & Foundry Co., and Thornwood, N. Y., awarded 400 tons of 6 to 12-in. to an unnamed maker. New inquiries include about 12 miles of 6 to 14-in. for a water supply distributing system for Wayne Township, N. J., 1400 tons of 30-in. for Newport News, Va., and 600 tons of 12 to 24-in. Class B for Washington. Prices are irregular,

with large tonnages commanding concessions of \$1 to \$2 a ton.

Prices per net ton delivered New York: Water pipe, 6-in. and larger, \$32.90; 4-in. and 5-in., \$35.90; 3-in., \$42.90. Class A and gas pipe, \$3 extra.

REINFORCING BARS

Quotations continue at 1.60c., Pittsburgh, or 1.93c., New York, for ordinary tonnages of billet steel bars. On the larger projects, concessions of \$1 and occasionally \$2 a ton are granted. New reinforced concrete projects are generally small, except for highway construction work in New Jersey, which is taking a substantial tonnage of reinforcement in various contracts. State hospital buildings at Brentwood, N. Y., will require about 500 tons of reinforcing bars.

OLD MATERIAL

No. 1 heavy melting steel is moving to the consumer at Coatesville, Pa., with brokers offering \$9 a ton, delivered for this shipment. Barges are still being loaded in New York harbor with No. 1 and No. 2 steel for shipment to Buffalo, but a slightly smaller tonnage is being obtained than a few weeks ago. The price for No. 2 steel, delivered to eastern Pennsylvania, which was advanced by brokers to \$7.50 a ton, delivered, has receded to the former level of \$7 a ton. Machine shop turnings have been bought at \$2.25 a ton, New York, by

brokers shipping to western Pennsylvania, and one broker is offering up to \$2.50 a ton, New York, for turnings to ship to eastern Pennsylvania. Heavy breakable cast is strong, with brokers paying \$10 a ton and occasionally higher prices to fill contracts with eastern Pennsylvania consumers and a foundry at Florence, N. J. Foundry grade stove plate is also stronger, with brokers offering \$7 a ton, delivered to New Jersey consumers which have a freight rate of \$2.20 a ton.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel..	\$5.50 to \$6.25
Heavy melting steel (yard)	3.00 to 3.50
No. 1 hvy. breakable cast.	6.50 to 7.00
Stove plate (steel works)...	3.75 to 4.00
Locomotive grate bars....	3.75 to 4.00
Machine shop turnings....	2.00 to 2.50
Short shoveling turnings..	2.00 to 2.50
Cast borings (blast fur. or steel works).....	2.25 to 2.50
Mixed borings and turnings	2.00
Steel car axles.....	13.00 to 13.50
Iron car axles	15.50 to 16.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	6.00 to 6.25
Forge fire	4.50
No. 1 railroad wrought....	3.25
No. 1 yard wrought, long..	7.25
Rails for rolling.....	6.25 to 6.75
Stove plate (foundry)....	4.75
Malleable cast (railroad)...	7.00 to 7.50
Cast borings (chemical)...	8.00 to 8.50
Prices per gross ton, deliv'd local foundries:	
No. 1 machry. cast.....	\$11.00 to \$11.50
No. 1 hvy. cast (columns, bldg. materials, etc.; cupola size)	9.00 to 9.50
No. 2 cast (radiators, cast boilers, etc.).....	8.00 to 8.50

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New Slotted Floor Plate Placed on Market

The Central Iron & Steel Co., Harrisburg, Pa., has developed and placed on the market a fabricated floor grating, designated as slotted floor plate. It is said to be non-skid and proof against slipping in any direction. Because of its basic design it requires no deep recess or rabbet in which to set.

It can be furnished in almost any gage and size up to 72 x 240 in. It allows free ventilation, free drainage, passage of light and reduced weight, and is recommended for fire escapes and exterior platforms; floorings and galleries in industrial plants where trapped fumes, gases or heat may produce a hazard; walkways around presses where light is valuable; and any other place where gratings have heretofore been used.

Warehouse Prices, f.o.b. New York

Base per Lb.

Plates and struc. shapes....	2.70c. to 3.10c.
Soft steel bars, small shapes..	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal..	7.00c. to 7.25c.
Cold-fin shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. scrap, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)...	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)...	4.00c.
Long terme sheets (No. 24)....	5.00c.
Standard tool steel.....	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed.....	5.15c.
Tire steel, ½ x ½ in. and larger..	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases,	
4.50c. to 7.00c.	

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller..	65 to 65 and 10
1 x 30 in. and smaller..	65 to 65 and 10
Carriage bolts, cut thread:	
¾ x 6 in. and smaller..	65 to 65 and 10
¾ x 20 in. and smaller..	65 to 65 and 10
Boiler Tubes:	
Lap welded, 2-in.....	\$19.00
Seamless steel, 2-in.....	20.25
Charcoal iron, 2-in.....	26.25
Charcoal iron, 4-in.....	67.00

PHILADELPHIA

Forward Buying Still Lacking— Pig Iron Weaker

PHILADELPHIA, Aug. 11.—Steel, pig iron and scrap buying is limited to minor tonnages for immediate requirements, consumers being unwilling to cover even for early fall needs. Steel mill operating rates are substantially unchanged. Prices are maintained with only small concessions on desirable tonnages of shapes and plates. Scrap prices show little variation, but pig iron lacks strength, competition between eastern Pennsylvania furnaces and other districts having brought slightly lower prices on desirable orders.

A fair number of fabricated steel projects are in the market, but tonnages are small, with the exception of an inquiry for a bridge in the New York district, which calls for about 3600 tons of plates.

PIG IRON

Although the furnaces of two steel companies are the only ones in blast in this district, the total of pig iron available for consumers in this market from furnace stocks is substantial. Including New England, Buffalo and eastern Pennsylvania furnaces, it is estimated that stocks on yards of producers are in excess of 500,000 tons. Estimated stocks at Southern furnaces are about 300,000 tons. Competition for foundry iron business is keen. Eastern Pennsylvania iron has been quoted on a basis of \$16 a ton, furnace. Meanwhile, Birmingham producers are maintaining \$11 a ton, furnace, or \$16.25, on dock, Philadelphia. Foundry iron from a New York State furnace is an active factor in this district, and some fair tonnages are moving to consumers here.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	16.76 to 17.01
East. Pa. No. 2X, 2.25 to 2.75 sil.	17.26 to 17.51
East. Pa. No. 1X, 1.75 to 2.25 sil.	17.76 to 18.01
Basic (del'd east. Pa.)	16.75
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'rg low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.04
Va. No. 2, 2.25 to 2.75 sil.	22.54

Prices, except as specified otherwise; are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

STEEL BARS

Buying is small, with consumers covering only immediate needs, and the quotation is unchanged at 1.60c., Pittsburgh, or 1.89c., Philadelphia. Billet steel reinforcing bars range from 1.60c. to 1.65c., Pittsburgh, or 1.89c. to 1.94c., Philadelphia, with concessions of \$1 a ton on the larger projects. Reinforced concrete construction projects are small, except for

a substantial tonnage of bars required in the Federal warehouse at C, D and Eighth and Ninth Streets, Washington, a project on which Philadelphia builders are bidding. Rail steel bar prices range from 1.20c. to 1.30c., Pittsburgh, or 1.49c. to 1.59c., Philadelphia.

SHAPES

Ordinary tonnages are generally quoted at 1.70c., f.o.b. nearest mill to consumer, or 1.76c., delivered Philadelphia. On the larger and more desirable shape requirements, concessions to 1.65c., mill, or 1.71c., Philadelphia, are not uncommon. Fabricators here are bidding on a number of small projects, including a school at Chester, Pa.; city hall at Bridgeton, N. J., and a post office and court house at Trenton, N. J.

PLATES

Mills have a small tonnage of orders on their books, but have taken but little new business in the past week or more. Prices are generally 1.70c. to 1.75c., Coatesville, Pa., or 1.80½c. to 1.85½c., Philadelphia, with occasional concessions of \$1 a ton from 1.70c., Coatesville, on the larger tonnages.

SHEETS

Consumers are buying only for prompt shipment and orders seldom are even as much as a carload. Prices, however, are still firm on the new price schedule, and efforts of distributors and large consumers of sheets to obtain concessions have been unsuccessful. Automobile body and accessory manufacturers are operating at better rates than some weeks ago, but are still producing at only a small percentage of normal.

IMPORTS

In the week ended Aug. 8, 3054 tons of chrome ore was received at this port from Cuba and 38 tons of pig

iron came from Norway. Steel arrivals consisted of 268 tons of structural shapes from Belgium and 58 tons from Germany and 10 tons of steel bars from France.

OLD MATERIAL

A broker who was offering \$7.50 a ton, delivered Conshohocken, Pa., for No. 2 steel has returned to the former buying price of \$7 a ton, delivered. No. 1 steel is moving in limited tonnages to Coatesville, Pa., at \$9 a ton, delivered, and to Claymont, Del., at \$8.50 a ton, delivered. A Harrisburg, Pa., mill has closed on two small orders for heavy breakable cast, totaling about 500 tons, at \$10.50 a ton. Carloads of cast iron carwheels have been sold at \$11.25 a ton, delivered eastern Pennsylvania. While there is apparently no surplus of either No. 1 or No. 2 steel in this market, consumers suggest that with the close of navigation on the barge canal in the fall, steel now moving to Buffalo consumers by barge from the New York district should be available for delivery to eastern Pennsylvania. As a result, consumers are not inclined to foresee stronger prices for these grades.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$8.25 to \$9.25
No. 2 heavy melting steel	7.00
No. 1 railroad wrought	10.00 to 10.50
Bundled sheets (for steel works)	6.50
Hydraulic compressed, new	7.00 to 8.00
Hydraulic compressed, old	6.00 to 7.00
Machine shop turnings (for steel works)	5.00 to 6.00
Heavy axle turnings (or equiv.)	8.00 to 8.50
Cast borings (for steel works and roll. mill)	5.00 to 6.00
Heavy breakable cast (for steel works)	10.50
Railroad grate bars	7.75
Stove plate (for steel works)	7.75
No. 1 low phos., hvy. (0.04% and under)	12.00 to 13.00
Couplers and knuckles	11.00
Roller steel wheels	11.00
No. 1 blast furnace	5.50
Wrot. iron and soft steel pipe and tubes (new specific.)	10.50 to 11.00
Shafting	16.50
Steel axles	16.00 to 16.50
No. 1 forge fire	8.00 to 8.50
Cast iron carwheels	12.00 to 12.50
No. 1 cast	11.00 to 11.50
Cast borings (for chem. plant)	11.50 to 12.00
Steel rails for rolling	10.50 to 11.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforce. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to ¼-in. inclu.	2.90c.
Spring steel	5.00c.
Hot rolled, box annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	4.00c.
Hot rolled blue annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼-in.	5.20c.
Swedish iron bars	6.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars

Shook & Fletcher Supply Co., Brown-Marx Building, Birmingham, has been appointed Southern sales agent for Mackintosh-Hemphill Co., Pittsburgh, and will handle rolling mill machinery in Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama and Mississippi.

Concrete Reinforcing Institute will hold its semi-annual meeting Sept. 28-30 at Buckwood Inn, Shawnee-on-Delaware, Pa.

BOSTON

Massachusetts Foundry Buys 2000 Tons of Pig Iron—Prices Easy

BOSTON, Aug. 11.—Pig iron sales the past week totaled about 2700 tons, of which a Massachusetts melter took 2000 tons. Competition for a Worcester, Mass., machinery manufacturer's business was keen and some low prices were made. Instead of buying 300 tons of No. 2 plain iron, as originally intended, the company took 400 tons and split the order between two furnaces at prices equivalent to about \$15 a ton, Buffalo. There is no open inquiry in the market, but a furnace is privately negotiating with a foundry for a sizable tonnage.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25..	19.91
*Buffalo, sil. 2.25 to 2.75..	19.91
†Buffalo, sil. 1.75 to 2.25..	19.28
†Buffalo, sil. 2.25 to 2.75..	19.28
*Ala., sil. 1.75 to 2.25.....	\$20.11 to 20.61
*Ala., sil. 2.25 to 2.75.....	20.61 to 21.11
†Ala., sil. 1.75 to 2.25.....	16.75
†Ala., sil. 2.25 to 2.75.....	17.25

Freight rates: \$4.91 all rail and \$4.28 rail and water from Buffalo; \$9.61 all rail from Alabama and \$5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

REINFORCING BARS

Lettings for the week were 900 tons, and included 500 tons for Massachusetts road work and 125 tons for a Harvard University memorial chapel. Prices on stock billet bars in 1 to 5-ton lots are 3c. a lb., base; in 6 to 99-ton lots, 2.40c.; and in 100-ton lots and larger, 2.30c. Rail steel bars are 2.26½c. a lb., Boston rate points.

CAST IRON PIPE

Hartford, Conn., closed bids Aug. 10 on 1886 tons of various sizes. The

only other sizable business in the market is 1940 tons of 6 to 16-in. pipe wanted by Medfield, Mass.

FABRICATED STEEL

Lettings for the week were about 1500 tons. The largest was 500 tons for a Newton, Mass., court house and memorial building, booked by the New England Structural Co.

OLD MATERIAL

Business is still confined to an occasional car of scrap sold by a manufacturer. Virtually nothing is being

moved out of yards. Prices are unchanged.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel..	\$4.50 to \$5.00
Scrap T rails.....	4.00 to 4.50
Scrap girder rails.....	3.00 to 3.50
No. 1 railroad wrought....	7.00 to 7.50
Machine shop turnings....	1.25 to 1.80
Cast iron borings (steel works and rolling mill)	1.50 to 1.75
Bundled skeleton, long....	3.00 to 3.25
Forged flashings.....	5.00 to 5.25
Blast furnace borings and turnings.....	1.50 to 1.75
Forge scrap.....	0.50 to 0.80
Shafting.....	10.00 to 10.50
Steel car axles.....	11.00 to 12.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	5.00 to 5.25
Rails for rolling.....	7.50 to 8.00
Cast iron borings, chemical	7.00 to 7.25
No. 2 cast.....	5.00 to 5.25

Prices per gross ton deliv'd consumers' yards:

Textile cast.....	\$9.50 to \$10.00
No. 1 machinery cast.....	9.50 to 10.00
Stove plate.....	5.00 to 5.25
Railroad malleable.....	13.00 to 13.50

ST. LOUIS

Scrap Prices Decline—Pig Iron Steady But Quiet

ST. LOUIS, Aug. 11.—Buying of pig iron is confined to small, scattered lots for prompt shipment. Sales are of foundry and malleable grades, no recent signs of interest having been shown by basic users. Additional open-hearth furnaces have been banked, and the beginning of the second week of August finds the melt at, or close to, the lowest rate this year. Blast furnace interests report competition extremely keen for what business there is, but prices are being closely adhered to, and, in the case of Southern iron, full silicon differentials are being obtained. Shipping directions for last half of August indicate a slightly better rate than for the first two weeks, though the total is expected to fall moderately below that of July.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.....	\$17.50
Malleable, f.o.b. Granite City.....	17.50
N'th'n No. 2 fdy., deliv'd St. Louis..	19.66
Southern No. 2 fdy., deliv'd.....	15.42
Northern malleable, deliv'd.....	19.66
Northern basic, deliv'd.....	19.66

Freight rates: 75c. (average) Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

FINISHED STEEL

While several sizable jobs are in the offing, lettings of contracts for structural steel and concrete bars continue on a moderate scale. Road construction and river and municipal improvement work are still accounting for liberal tonnages of a variety of commodities. A slight recession was noted in demand for sheets and plates. Can companies are reducing their estimates of tin plate requirements, and some suspensions are reported. The movement of all descriptions of iron and steel goods for consumption in the rural areas is the smallest for this season in more than a decade. The Laclede Steel Co. was awarded 250 tons of reinforcing concrete bars for the

Fine Arts Building at the Louisiana State University, Baton Rouge, La.

OLD MATERIAL

Prices of iron and steel scrap were subjected to further sharp downward revisions during the past week, with steel specialties hardest hit. Practically all items in this category were reduced from 25c. to \$1 a ton. An East Side mill took a round tonnage of steel specialties, but otherwise purchasing by the industries was almost entirely absent. Stocks in consumers' hands vary widely, some possessing enough material for six months at the present rate of operations, while others have only enough to carry on from week to week. Yard stocks are the largest in many months. Railroad offerings are still in considerable volume, latest lists comprising the following: Nashville, Chattanooga & St. Louis, 8 carloads; Chesapeake & Ohio, 6900 tons; Rock Island, 43 carloads;

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates.....	3.36½c.
Structural shapes—	
Angles and beams.....	3.36½c.
Tees.....	3.36½c.
Zees.....	3.36½c.
Soft steel bars, small shapes....	3.26½c.
Reinforcing bars.....	3.11½c. to 3.26½c.
Iron bars—	
Refined.....	3.26½c.
Best refined.....	4.60c.
Norway rounds.....	6.60c.
Norway squares and flats.....	7.10c.
Spring steel—	
Open-hearth.....	5.00c. to 10.00c.
Crucible.....	12.00c.
Tire steel.....	4.50c. to 5.75c.
Bands.....	4.015c. to 5.00c.
Hoop steel.....	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.....	3.50c. to 5.50c.
Squares and flats.....	4.00c. to 6.00c.
Toe calk steel.....	6.00c.
Rivets, structural or boiler.....	4.80c.

Per Cent Off List

Machine bolts.....	.65 and 5
Carriage bolts.....	.65 and 5
Lag screws.....	.65 and 5
Hot-pressed nuts.....	.40 and 10
Cold-punched nuts.....	.40 and 10
Stove bolts.....	.70 and 10

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.00c.
Cold-fin. rounds, shafting, screw stock.....	3.35c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24).....	4.35c.
Hot-rolled sheets (No. 10).....	3.45c.
Black corrug. sheets (No. 24).....	3.85c.
Galv. corrug. sheets.....	4.40c.
Structural rivets.....	4.15c.
Boiler rivets.....	4.15c.
Per Cent Off List	
Tank rivets, ¼-in. and smaller, 100 lb. or more.....	65
Less than 100 lb.....	60
Machine bolts.....	.60 and 10
Carriage bolts.....	.60 and 10
Lag screws.....	.60 and 10
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more.....	.60 and 10
Less than 200 lb.....	.50 and 10
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more.....	.60 and 10
Less than 200 lb.....	.50 and 10

Pullman Co., 11 carloads; International Great Northern, 14,000 tons, and Big Four, 38 tons.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	\$8.00 to	\$8.25
No. 1 heavy melting or shoveling steel	7.75 to	8.25
No. 2 heavy melting or shoveling steel	7.00 to	7.50
No. 1 locomotive tires....	10.50 to	11.00
Misc. stand-sec. rails including frogs, switches and guards, cut apart...	8.75 to	9.25
Railroad springs	9.25 to	9.75
Bundled sheets	5.00 to	5.50
No. 2 railroad wrought...	7.75 to	8.25

No. 1 busheling.....	6.00 to	6.50
Cast iron borings and shoveling turnings	5.50 to	6.00
Iron rails	8.00 to	8.50
Rails for rolling.....	10.50 to	11.00
Machine shop turnings....	3.00 to	3.50
Heavy turnings	6.50 to	7.00
Steel car axles.....	11.50 to	12.00
Iron car axles.....	15.00 to	15.50
Wrot. iron bars and trans.	8.25 to	8.75
No. 1 railroad wrought...	5.00 to	5.50
Steel rails, less than 3 ft...	12.00 to	12.50
Steel angle bars.....	8.00 to	8.50
Cast iron carwheels.....	7.25 to	7.75
No. 1 machinery cast....	8.50 to	9.00
Railroad malleable	7.50 to	8.00
No. 1 railroad cast.....	7.50 to	8.00
Stove plate	7.00 to	7.50
Relay. rails, 60 lb. and under	16.00 to	16.50
Relay. rails, 70 lb. and over	20.00 to	21.00
Agricult. malleable	6.75 to	7.25

BUFFALO

Pig Iron Inquiry and Sales Are Small—Scrap Undertone Stronger

BUFFALO, Aug. 10.—The trend of pig iron inquiry continues downward, with only a single lot before Buffalo makers this week. This inquiry is for 150 tons from a manufacturer of railroad equipment. Sales during the past week were in proportion to the small inquiry. While producers here are endeavoring to adhere to a \$15.50, base, on Eastern inquiry, they admit little tonnage can be booked at this price. Five furnaces continue in blast.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	\$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1 fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal.....	25.28

FINISHED STEEL

Operation of steel works is being carried on this week in 12 of the 37 open-hearth furnaces in the Buffalo district. Republic Steel Corp. is operating two furnaces, Wickwire Spencer two, Gould Coupler one, Bethlehem eight. The largest inquiry for finished material reported this week is one for more than 1100 tons of structural and reinforcing bars for the new hospital of the Buffalo division of the Order of the Sisters of Charity. Bids are expected to be taken about Oct. 15. Several grade crossing projects of good size also are scheduled for early autumn construction. The reinforcing bar market continues quiet, with nothing of large size pending.

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes.....	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq.....	3.65c.
Rounds and hex.....	3.15c.
Cold-rolled strip steel.....	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24).....	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10).....	3.50c.
Com. wire nails, base per keg.....	\$2.45
Black wire, base per 100 lb.....	3.20

Pipe demand from the new natural gas fields of western New York and northern Pennsylvania continue exceptionally good, with some large deals being scheduled during the next 60 days.

OLD MATERIAL

Buffalo sellers continue to accumulate scrap rather than market it at the current offering of the principal consumer. This accumulation has increased recently because of somewhat larger receipts, but dealers say stocks both in their own yards and at the plants of principal mills here are far below the average for this time of the year. The district's largest consumer

continues to offer \$7.50 for No. 2 heavy melting steel without being able to pick up much, if any, tonnage, according to dealers who claim the actual market for many materials is 50c. to \$1 above the nominal quotations which have prevailed for the past 30 days. Greater strength in outside markets is reported to be drawing considerable material that normally would be coming to Buffalo.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:

No. 1 heavy melting steel..	\$9.00
No. 2 heavy melting scrap.....	7.50
Scrap rails	\$10.00 to 10.50
Hydraul. comp. sheets.....	7.50
No. 2 hydraul. comp. sheets	7.00
Hand bundled sheets.....	7.00
Drop forge flashings.....	7.50
No. 1 busheling.....	7.50
Hvy. steel axle turnings....	8.50 to 9.50
Machine shop turnings....	4.50 to 5.00
No. 1 railroad wrought...	7.50 to 8.00

Acid Open-Hearth Grades:

Knuckles and couplers....	11.00 to 11.50
Coil and leaf springs....	11.00 to 11.50
Rolled steel wheels.....	11.00 to 11.50
Low phos. billet and bloom ends	13.00 to 14.00

Electric Furnace Grades:

Short shov. steel turnings..	6.00 to 6.50
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Blast Furnace Grades:

Short mixed borings and turnings	6.00 to 6.50
Cast iron borings.....	6.00 to 6.50
No. 2 busheling.....	4.50 to 5.00

Rolling Mill Grades:

Steel car axles.....	15.00 to 15.50
Iron axles	16.00 to 16.50

Cupola Grades:

No. 1 machinery cast.....	9.75 to 10.00
Stove plate	8.00 to 8.25
Locomotive grate bars....	7.00 to 7.50
Steel rails, 3 ft. and under	13.00 to 13.50
Cast iron carwheels.....	11.50 to 12.00

Malleable Grades:

Industrial	10.00 to 10.50
Railroad	10.00 to 10.50
Agricultural	10.00 to 10.50

Special Grades:

Chemical borings	9.00 to 9.50
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BIRMINGHAM

No Improvement in Pig Iron—Steel Tonnage Varies Little

BIRMINGHAM, Aug. 11.—August is bringing no improvement in the pig iron market. Buying continues to be irregular, with small day-to-day orders. Quotations for district tonnage are still at \$12 to \$13. Foundry production has been running ahead of shipments for several months, but the gap is being gradually lessened. Late in July, Woodward Iron Co. blew out one furnace and is slowing up the other two. Republic Steel will probably change one of its two active stacks to basic for about two weeks during this month. Active furnaces number 10, no changes having been made this month.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil..	\$12.00 to \$13.00
No. 1 fdy., 2.25 to 2.75 sil..	12.50 to 13.50
Basic	12.00 to 13.00

FINISHED STEEL

New tonnage from week to week is not large, but is maintaining a

fair level. The past week was somewhat better than the preceding one. One manufacturer reports that bookings so far this month are slightly ahead of those of the same period in July. Fabricators of structural steel and reinforcing bars are facing more restricted markets as the summer season advances and new projects become fewer. Most of the present bar orders are under 100 tons and generally around 50 tons or less. No structural tonnage of size was secured by Birmingham fabricators last week. Active open-hearths total 11, the Tennessee company operating four at Ensley and four at Fairfield, and Gulf States Steel three at Alabama City.

CAST IRON PIPE

Birmingham pipe plants are running more and more on a hand-to-mouth basis. Weekly bookings are now small and do not provide for operations very far in advance. Plant

operations range from 40 to 50 per cent and prospects are slight for early improvement. Quotations remain at \$35 to \$36. Birmingham plants are expecting to secure about 1200 tons from Dallas, Tex., but this order has not yet been placed.

OLD MATERIAL

The market last week maintained the slight improvement that was felt two weeks ago. Inquiries, sales and

shipments during these two weeks have shown a moderate increase.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....	\$8.50 to \$9.00
Scrap steel rails.....	8.50
Short shoveling turnings..	6.50
Cast iron borings.....	(No market)
Stove plate	7.00
Steel axles	15.00 to 16.00
Iron axles	18.00
No. 1 railroad wrought....	8.00
Rails for rolling.....	11.50 to 12.00
No. 1 cast.....	9.00
Tramcar wheels	10.25 to 10.50
Cast iron borings, chem...	13.50

PACIFIC COAST

SAN FRANCISCO, Aug. 10.—With no important lettings of structural shapes and plates and with only 500 tons of awards in reinforcing bars, the week has been the quietest the Pacific Coast trade has experienced this year. However, general contracts have been let on projects involving about 10,000 tons of bars, which should be placed during the next few weeks, while pending structural steel business approximates 15,000 tons, with an additional 20,000 tons in definite prospect for bidding during the next month.

Mill prices in carload lots, c.i.f. Pacific ports, have weakened on plates and bars, bringing current quotations down to 2c. on soft steel bars and to 1.85c. to 1.90c. on tank plates. Sheets continue at firm levels.

BARS

The Highway Commission of the State of California opened bids for construction projects requiring more than 900 tons of bars, and announcement of awards of general contracts is expected within a week. Public lettings were a little over 500 tons, of which 381 tons went to the Blue Diamond Corp., Los Angeles, for supplying that city with 15,000 pieces, 1/2 x 1/2 in., in 60-ft. lengths at a price of 2.49c.

PLATES

Current quotations are from 1.85c. to 1.90c. a lb., c.i.f. Pacific Coast ports, a decline of \$2 to \$3 a ton.

SHAPES

Importations of structural shapes continue to deprive domestic mills of

Business Quiet, But Large Lettings of Bars and Shapes Are Pending

F.O.B. Warehouse Prices

(Less than 5000 Lb.)

	Base per Lb.—		
	San Fran-	Los	Seattle
cisco	Angelo		
Plates and struc. shapes, 1/4-in. and heavier	2.80c.	3.00c.	2.40c.
Soft steel bars.....	2.80c.	3.00c.	2.40c.
Reinforcing bars..	2.80c.	2.80c.	3.00c.
Hot-rolled annealed sheets (No. 24)...	3.90c.	4.00c.	3.50c.
Hot-rolled sheets (No. 10)	3.40c.	3.50c.	3.00c.
Galv. sheets (No. 24)	4.40c.	4.20c.	3.85c.
Struc. rivets, 1/2 in. and larger, less than 1000 lb....	5.00c.	5.00c.	5.50c.
Special nails: common 4 to 60d; smooth box 4 to 20d; finish 6 and 8d; base per keg	\$2.55	\$2.45	\$2.40
Other wire nails, base per keg....	2.80	2.70	2.65
Cement c'd nails, 100-lb. keg.....	2.65	2.70	2.65

tonnage and to increase the competitive tension of the market. Bids will be received up to Sept. 23 by the Bureau of Yards and Docks, Navy Department, Washington, for a steel frame dirigible hangar at Sunnyvale, Cal., requiring about 8000 tons of steel.

CAST IRON PIPE

About 2800 tons is now pending in public lettings, with an additional 750 tons to come up in projects on which bids will be taken during the next two weeks. Inquiries are light. Lettings of only 200 tons are reported, the largest to the Hazard Contracting Co., at San Diego, for a 16-in. Class C installation there.

turn are showing weakness. This territory has been almost devoid of structural steel work, with fabricators competing keenly for the few active jobs. The result is that prices have been exceptionally low. Billet steel reinforcing bars continue to be sold at considerable concessions under the 1.60c., Pittsburgh, schedule. Several jobs have been taken recently at 1.40c., and even lower prices are being made in certain instances.

In contrast with the softness evident in quotations of bars, shapes and plates, sheets and strip steel are firm at the new schedules. Orders have been meager and for small lots, but mills are anticipating better bookings next month.

The dullness in sheet steel is reflected in the shutdown during the past week of the sheet mills of a producer in this district, while an important sheet maker outside the Detroit area, but dependent to a considerable extent on the automobile industry for tonnage, operated at 30 per cent. Great Lakes Steel Corp. is now running its strip mill and both merchant bar mills.

PIC IRON

Pig iron users are taking less iron than in July, but this is not surprising in view of the fact that many foundries are closed. Oakland-Pontiac, Cadillac and Buick are among the foundries which are down at the moment. After several weeks of idleness, a large foundry at Muskegon has resumed pouring iron. It will not be long until several large consumers, notably Chevrolet gray iron foundry at Saginaw, will begin accumulating stocks, delivered by water, to carry them through the winter after the Lake navigation season closes. Two large melters at Muskegon generally follow this custom, taking advantage of the low water rates to get their winter pig iron supply at a comparatively cheap delivered price.

OLD MATERIAL

There has been no change in prices on old material. The market is firm, but there is little buying. The largest local consumer has held up shipments temporarily.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	\$7.00 to \$7.50
Borings and short turnings	4.50 to 5.00
Long turnings	4.00 to 4.50
No. 1 machinery cast.....	8.00 to 8.50
Automotive cast.....	11.00 to 11.50
Hydraulic comp. sheets....	7.00 to 7.50
Stove plate	5.50 to 6.00
New No. 1 busheling....	5.50 to 6.00
Old No. 2 busheling.....	2.50 to 3.00
Sheet clippings	4.00 to 4.50
Flashings	5.75 to 6.25

DETROIT Weakness in Bars, Plates and Shapes—Sheets and Strip Firm

DETROIT, Aug. 10.—With the automobile industry operating at a low rate, the local steel market is lethargic. Chevrolet and Plymouth are the only makers which are taking steel shipments in substantial volume. Ford suspended releases at the end of July and there is little promise of steel tonnage for the Rouge plant this month, although steel offices

anticipate a Ford "buy" for September late in August.

Following the abrupt abandonment of a Detroit base for quoting bars the early part of last week, mills have been quoting 1.60c., Pittsburgh, but it is said that concessions of \$1 a ton are being made to secure attractive business. There is slight demand for shapes and plates, but these in

R. A. S. Johnson, former Chicago representative for the Box Crane & Hoist Corp., Philadelphia, is now representing the Moloch Foundry & Machine Co., Kaukauna, Wis. His headquarters is at 112 West Adams Street, Chicago.

CANADA Dominion Steel Industry Operating at About 50 Per Cent

TORONTO, Aug. 10.—Curtailement in operations is becoming more pronounced in the iron and steel industry of Canada. In addition to the almost general suspension of volume buying by consuming interests, seasonal slackness is more acute than it has been for several years past. Buying of raw materials is being held to a minimum as company officials are making a special effort to hold inventories as low as possible.

Plants are operating largely on hand-to-mouth orders. Railways are not buying at present, and there is little prospect of large contracts from this source as long as earnings are on the downgrade. Many blame the wheat situation, with the low price and limited market, for the low railway earnings.

Steel mills are also running on reduced schedules, with production around 50 per cent, against between 70 and 80 per cent a year ago.

A redeeming feature in Canadian industry is the fact that since the new tariff rates went into effect a large number of foreign companies have announced plans for establishing plants in this country. A number have already started building operations. The majority are from the United States, although several British and Continental companies have announced intentions of locating branch plants here.

PIG IRON

Merchant pig iron sales dropped to lower levels during the week. Orders

continue to run to single car lots, and even this type of business was stagnant in the past week. Shipments are at the lowest level in several years. Local blast furnace representatives see little prospect of improvement until after the summer. Prices are unchanged.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$22.60
No. 2 fdy., sil. 1.75 to 2.25.....	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	\$24.00
No. 2 fdy., sil. 1.75 to 2.25.....	23.50
Malleable	24.00
Basic	20.50

OLD MATERIAL

The market for iron and steel scrap is in a state of stagnation. Consumers are picking up odd car lots, but no future or large tonnage business has been booked for some time past.

Dealers' buying prices for old material: Per Gross Ton

	Toronto	Montreal
Heavy melting steel.....	\$7.00	\$6.00
Rails, scrap	7.00	6.00
No. 1 wrought.....	6.00	8.00
Machine shop turnings...	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings.....	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron....	7.00	11.00
No. 1 machinery cast....	10.00	10.00
Stove plate	8.00	8.00
Standard carwheels.....	8.50	8.50
Malleable	8.00	8.00

Per Net Ton

No. 1 machinery cast....	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

CINCINNATI Foundry Operations Gain Slightly—Northern Pig Iron Prices Unsettled

CINCINNATI, Aug. 10.—With reports that a few foundries in the district have increased production slightly during the past week, the trade feels that the market has a trifle

better tone. However, demand for pig iron has shown no change. Sales totaled 1650 tons, of which 500 tons was sold to a southern Ohio consumer, and the remainder was made up of less than 100-ton lots. Competition for business is increased to such an extent that price concessions are regular occurrences. Apparently there is no established price on Northern iron in this district. On the other hand, Southern iron is firm, furnaces having consistently refused concessions on silicon differentials. There has been relatively little buying of Southern iron and therefore no accurate test of the present schedule.

Prices per gross ton, deliv'd Cincinnati:
Ala. fdy., sil. 1.75 to 2.25.....\$14.69
Ala. fdy., sil. 2.25 to 2.75.....15.19
Tenn. fdy., sil. 1.75 to 2.25.....14.69
S'th'n Ohio silvery, 8 per cent.....23.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

FINISHED STEEL

Despite the virtual withdrawal of automobile manufacturers from the

market, following shutdowns of a number of plants, the demand for sheets during the last week continued at about the same level as in the preceding week. Fresh bookings were in sufficient quantity to sustain operations of sheet mills last week and this week at slightly less than 40 per cent of capacity. Consumers are placing orders for the third quarter at the new quotations.

OLD MATERIAL

There has been no change in the scrap market. A small sale to a southern Ohio mill was reported during the week. The acceptance of blast furnace material by another district mill was also reported. Dealers' bids are unchanged.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$7.25 to \$7.75
Scrap rails for melting...	10.25 to 10.75
Loose sheet clippings.....	3.50 to 4.00
Bundled sheets	6.75 to 7.25
Cast iron borings.....	3.75 to 4.25
Machine shop turnings....	4.00 to 4.50
No. 1 busheling.....	5.75 to 6.25
No. 2 busheling.....	3.75 to 4.25
Rails for rolling.....	11.00 to 11.50
No. 1 locomotive tires....	9.50 to 10.00
No. 2 railroad wrought...	7.25 to 7.75
Short rails	13.00 to 13.50
Cast iron carwheels.....	10.50 to 11.00
No. 1 machinery cast.....	12.50 to 13.00
No. 1 railroad cast.....	11.50 to 12.00
Burnt cast	5.25 to 5.75
Stove plate	5.25 to 5.75
Brake shoes	5.25 to 5.75
Agricultural malleable....	10.00 to 10.50
Railroad malleable	11.00 to 11.50

Proposal to Base Scrap on Steel Bar Price

A proposal to stabilize the price of scrap iron and steel on the basis of steel bars is being considered by the purchasing department of a leading steel mill in California, in cooperation with the Pacific Coast chapter of the Institute of Scrap Iron and Steel. The proposal contemplates the fixing of the price of "yard scrap" at a percentage of the market price for steel bars. No. 1 heavy melting steel would be priced at a fixed differential above the price of yard scrap. The price would be f.o.b. cars at dealers' yards as of the time the order is issued.

Wisconsin to Buy Sheets for License Plates

Manufacturers of steel sheets have been invited to submit samples to the automobile license plate shop of the Wisconsin State Prison at Waupun for the supply of 1932 tags for the Secretary of State's office, requiring about 600 tons of material. The contract will not be awarded until tests have been made. Oscar Lee, warden of the prison, has indicated that Wisconsin labor will be favored if prices are in line. There is but one manufacturer of sheet steel in the State, that being the Inland Steel Co. of Wisconsin, with plant and offices in Milwaukee.

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.

Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.00c.
New billet reinfrc. bars.....	3.00c.
Rail steel reinfrc. bars.....	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex.....	3.50c.
Squares	4.00c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24).....	4.25c.
Hot-rolled sheets (No. 10).....	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg (25	
kegs or more).....	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb.....	10.25

Net per 100 Ft.

Lap-welded steel boiler tubes, 2-in..	\$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in....	17.50
4-in.	36.00

▲▲ Semi-Finished Steel, Raw Materials, Bolts and Rivets ▲▲

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	\$29.00
Rerolling, 4-in. and under 10-in., Youngstown	29.00
Rerolling, 4-in. and under 10-in., Cleveland	29.00
Rerolling, 4-in. and under 10-in., Chicago	31.00
Forging quality, Pittsburgh	35.00

Sheet Bars (Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	\$29.00
Youngstown	29.00
Cleveland	29.00

Skelp (F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Slabs

	Per Gross Ton
(8 in. x 2 in. and under 10 in. x 10 in.)	
Pittsburgh	\$29.00
Youngstown	29.00
Cleveland	29.00

Wire Rods

	Per Gross Ton
(Common soft, base)	
Pittsburgh	\$35.00
Cleveland	35.00
Chicago	36.00

PRICES OF RAW MATERIAL

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	\$4.50
Old range non-Bessemer, 51.50% iron	4.85
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron, dry, Spanish or Algerian	3c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Iron ore, basic and foundry, Russian, average 63% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	25c. to 27c.
Manganese ore, African or Indian, 50 to 52%	24c. to 26c.
Manganese ore, Brazilian, 46 to 48%	22c. to 24c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$12.00 to \$12.50

	Per Gross Ton
Chrome ore, 45% Cr ₂ O ₃ crude, c.i.f. Atlantic seaboard	\$20.00
Chrome ore, 48% Cr ₂ O ₃ crude, c.i.f. Atlantic seaboard	22.50

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$2.40
Foundry, f.o.b. Connellsville prompt	\$3.25 to 4.50
Foundry, by-product, Ch'go ovens	7.50
Foundry, by-product, New England, del'd	10.50
Foundry, by-product, Newark or Jersey City, delivered	8.70 to 9.10
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.40 to \$1.50
Mine run coking coal, f.o.b. W. Pa.	1.50 to 1.60
Gas coal, 1/4-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.90 to 1.00
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	\$80.00 to \$85.00
Foreign, 80%, Atlantic or Gulf port, duty paid	*80.00 to 85.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	\$28.00 to \$30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	\$83.50
75%	130.00
	Per Gross Ton Furnace
10%	\$85.00
11%	87.00
	Per Gross Ton
12%	14 to 16%
	\$1.00

Bessemer Ferrosilicon

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	
10%	\$25.00
11%	26.00
12%	27.00
	Per Gross Ton
13%	\$29.00
14%	31.00
15%	33.00

Silvery Iron

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	
6%	\$19.00 to \$21.00
7%	19.50 to 21.50
8%	20.00 to 22.00
9%	20.50 to 22.50
10%	21.00 to 23.00
11%	22.00 to 24.00
12%	23.00 to 25.00
13%	24.00 to 26.00
14%	25.00 to 27.00
15%	26.00 to 28.00

Delivered prices at Chicago are about 50c. a ton below this schedule.

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd, carloads	\$1.08
Ferrotungsten, less carloads	\$1.15 to 1.25
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 20.00c.
Ferrochromium, 0.10% carbon	24.50c. to 26.00c.
Ferrochromium, 0.06% carbon	26.50c. to 28.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	\$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferromolybdenum, per lb. contained Mo., delivered	1.00
Calcium molybdate, per lb. contained Mo., delivered	85c.

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	73 and 10
Carriage bolts	73 and 10
Lag bolts	73 and 10
Flot bolts, Nos. 1, 2, 3 and 7 heads	73 and 10
Hot-pressed nuts, blank or tapped, square	73 and 10
Hot-pressed nuts, blank or tapped, hexagons	73 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	73 and 10
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	73 and 10
Semi-finished hexagons castellated nuts, S.A.E.	73 and 10
Stove bolts in packages, P'gh.	80, 10, 10, 10 and 5
Stove bolts in packages, Ch'go.	80, 10, 10, 10 and 5
Stove bolts in pkgs., Cleveland	80, 10, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 10, 5 and 2 1/2
Stove bolts in bulk, Ch'go.	80, 10, 10, 10, 5 and 2 1/2
Stove bolts in bulk, Cleveland	80, 10, 10, 10, 5 and 2 1/2
Tire bolts	60, 10 and 10
Discounts of 73 and 10 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.	

Large Rivets

	Base per 100 Lb.
(1/2-in. and larger)	
F.o.b. Pittsburgh or Cleveland	\$2.75
F.o.b. Chicago	2.85

Small Rivets

(1/8-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	85 and 10
Upset hex. head cap screws, U.S.S.S. thread	85 and 10
Upset set screws, S.A.E. thread	80, 10 and 5
Milled studs	70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c.
F.o.b. Chicago.....	1.70c.
Del'd Philadelphia.....	1.89c.
Del'd New York.....	1.93c.
F.o.b. Cleveland.....	1.65c.
F.o.b. Lackawanna.....	1.70c.
F.o.b. Birmingham.....	1.70c.
C.i.f. Pacific ports.....	2.00c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.....	1.60c.
F.o.b. Birmingham, mill lengths.....	1.75c.
F.o.b. Cleveland.....	1.55c. to 1.60c.

Roll Steel

F.o.b. mills, east of Chicago dist.....	1.30c. to 1.35c.
F.o.b. Chicago Heights mill.....	1.60c. to 1.65c.
Del'd Philadelphia.....	1.49c. to 1.59c.

Iron

Common iron, f.o.b. Chicago.....	1.70c. to 1.80c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.09c.
Common iron, del'd New York.....	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c.
F.o.b. Chicago.....	1.70c.
F.o.b. Birmingham.....	1.70c.
Del'd Cleveland.....	1.78 1/2c.
Del'd Philadelphia.....	1.80 1/2c.
F.o.b. Coatesville.....	1.70c.
F.o.b. Sparrows Point.....	1.70c.
F.o.b. Lackawanna.....	1.70c.
Del'd New York.....	1.88c.
C.i.f. Pacific ports.....	1.85c. to 1.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.60c.
F.o.b. Chicago.....	1.70c.
F.o.b. Birmingham.....	1.70c.
F.o.b. Lackawanna.....	1.70c.
F.o.b. Bethlehem.....	1.70c.
Del'd Cleveland.....	1.78 1/2c.
Del'd Philadelphia.....	1.71c. to 1.76c.
Del'd New York.....	1.85 1/2c.
C.i.f. Pacific ports.....	2.05c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, Pittsburgh.....	1.65c.
Wider than 6 in., P'gh.....	1.55c.
6 in. and narrower, Chicago.....	1.75c.
Wider than 6 in., Chicago.....	1.65c.
Cooperage stock, P'gh.....	1.75c. to 1.85c.
Cooperage stock, Chicago.....	1.85c. to 1.95c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.10c.
Bars, f.o.b. Chicago.....	2.10c.
Bars, Cleveland.....	2.10c.
Bars, Buffalo.....	2.10c.
Shafting, ground, f.o.b. mill.....	2.45c. to 3.40c.
Strips, P'gh.....	2.15c.
Strips, Cleveland.....	2.15c.
Strips, deliv'd Chicago.....	2.43c.
Strips, Worcester.....	2.30c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland.....	3.20c.

*According to size.

Wire Products

	Base per Lb.
(Carload lots, f.o.b. Pittsburgh and Cleveland)	
Bright wire.....	2.20c.
Spring wire.....	3.20c.

To Jobbing Trade

	Base per Keg
Standard wire nails.....	\$1.90
Smooth coated nails.....	1.90
Galvanized nails.....	3.90

To Retail Trade

	Base per Lb.
Smooth annealed wire.....	2.35c.
Smooth galvanized wire.....	2.30c.
Polished staples.....	2.35c.
Galvanized staples.....	2.60c.
Barbed wire, galvanized.....	2.55c.
Woven wire fence, Nos. 9 and 11 gage, per net ton.....	\$55.00
Woven wire fence, No. 12 1/2 gage and lighter, per net ton.....	60.00

	Base per Keg
Standard wire nails.....	\$2.00
Cement coated nails.....	2.00
Galvanized nails.....	4.00

	Base per Lb.
Smooth annealed wire.....	2.45c.
Smooth galvanized wire.....	2.90c.

	Base per Lb.
Polished staples.....	2.45c.
Galvanized staples.....	2.70c.
Barbed wire, galvanized.....	2.65c.

	Base per Lb.
Woven wire fence, Nos. 9 and 11 gage, per net ton.....	\$60.00
Woven wire fence, 12 1/2 gage and lighter, per net ton.....	65.00

Anderson, Ind., mill prices are ordinarily \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

Sheets

Hot-Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh.....	1.70c.
No. 10, f.o.b. Chicago mills.....	1.80c.
No. 10, del'd Philadelphia.....	1.99c.
No. 10, f.o.b. Birmingham.....	1.85c.
No. 10, c.i.f. Pacific Coast ports.....	2.33c.

(Note: To above prices are added extras for annealing and for width over 48 in., and for less than five tons of each gage or size.)

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh.....	2.40c.
No. 24, f.o.b. Chicago mills.....	2.50c.
No. 24, del'd Philadelphia.....	2.69c.
No. 24, f.o.b. Birmingham.....	2.55c.
No. 24, c.i.f. Pacific Coast ports.....	2.88c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh.....	2.35c.
No. 10 gage, f.o.b. Chicago mills.....	2.45c.
No. 10 gage, del'd Philadelphia.....	2.64c.
No. 10 gage, f.o.b. Birmingham.....	2.50c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh.....	2.95c.
No. 20 gage, f.o.b. Chicago mills.....	3.05c.
No. 20 gage, del'd Philadelphia.....	3.24c.
No. 20, f.o.b. Birmingham.....	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	3.10c.
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Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh.....	2.75c.
No. 20, f.o.b. Pittsburgh.....	3.35c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets

No. 24, f.o.b. Pittsburgh.....	2.90c.
No. 24, f.o.b. Chicago Mills.....	3.00c.
No. 24, del'd Philadelphia.....	3.19c.
No. 24, f.o.b. Birmingham.....	3.05c.
No. 24, c.i.f. Pacific Coast ports.....	3.38c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. P'gh.....	3.15c.
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Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh.....	2.90c.
No. 20, f.o.b. Pittsburgh.....	3.40c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.55c. to 2.65c.
No. 26, Chicago mills.....	2.65c. to 2.75c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.00
Standard cokes, f.o.b. Gary.....	5.10

Terne Plate

	(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)	
8-lb. coating I.C. \$10.30 | 25-lb. coating I.C. \$15.20	
15-lb. coating I.C. 12.90 | 30-lb. coating I.C. 16.00	
20-lb. coating I.C. 14.00 | 40-lb. coating I.C. 17.80	

Alloy Steel Bars

	(F.o.b. maker's mill)
Alloy Quantity Bar Base, 2.65c. per Lb.	
S.A.E. Series	Alloy Differential
2000 (1 1/2% Nickel).....	\$0.25
2100 (1 1/2% Nickel).....	0.55
2200 (3 1/2% Nickel).....	1.50
2300 (5% Nickel).....	2.25
3100 Nickel Chromium.....	0.55
3200 Nickel Chromium.....	1.35
3300 Nickel Chromium.....	3.80
3400 Nickel Chromium.....	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45
5100 Chromium Spring Steel.....	0.20
6100 Chromium Vanadium Bar.....	1.20
6100 Chromium Vanadium Spring Steel.....	0.95
9250 Silicon Manganese Spring Steel (flats).....	0.25
Rounds and squares.....	0.50
Chromium Nickel Vanadium.....	1.50
Carbon Vanadium.....	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is 1/2c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	34.00
Light (from rail steel), f.o.b. mill.....	32.00

Track Equipment

	Base per 100 Lb.
Spikes, 1/2 in. and larger.....	\$2.70
Spikes, 3/4 in. and larger.....	2.70
Spikes, boat and barge.....	2.90
Tie plate, steel.....	1.95
Angle bars.....	2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	.73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld			Iron		
Inches	Steel	Black	Inches	Black	Galv.
1/8	47	21 1/2	1/4 and 3/8	+11	+36
1/4 to 3/8	53	27 1/2	1/2	23	5
1/2	55	44 1/2	3/4	28	11
3/4	62	50 1/2	1 and 1 1/4	31	15
1 to 3	64	52 1/2	1 1/2 and 2	35	18
2	57	45 1/2	Lap Weld		
2 1/2 to 6	61	49 1/2	2	23	9
7 and 8	58	45 1/2	2 1/2 to 3 1/2	28	13
9 and 10	56	43 1/2	4 to 6	30	17
11 and 12	55	42 1/2	7 and 8	29	16
			9 to 12	26	11
Butt Weld, extra strong, plain ends					
1/8	43	26 1/2	1/4 and 3/8	+13	+41
1/4 to 3/8	49	32 1/2	1/2	23	7
1/2	55	44 1/2	3/4	28	12
3/4	60	49 1/2	1 to 2	34	18
1 to 1 1/2	62	51 1/2			
2 to 3	63	52 1/2			
Lap Weld, extra strong, plain ends					
2	55	44 1/2	2	29	13
2 1/2 to 4	59	48 1/2	2 1/2 to 4	34	20
4 1/2 to 6	58	47 1/2	4 1/2 to 6	33	19
7 to 8	54	41 1/2	7 and 8	31	17
9 and 10	47	34 1/2	9 to 12	21	8
11 and 12	46	33 1/2			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2 1/2%, and on galvanized by 1 1/2 points with supplementary discounts of 5 and 2 1/2%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2 1/4 in.	38	1 1/4 in.	1
2 1/2 in.—2 3/4 in.	46	1 1/2 in.	8
3 in.—3 1/4 in.	52	2 in.—2 1/4 in.	13
3 1/2 in.—3 3/4 in.	54	2 1/2 in.—2 3/4 in.	16
4 in.	57	3 in.	17
4 1/2 in. to 6 in.	46	3 1/2 in. to 3 3/4 in.	18
		4 in.	20
		4 1/2 in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts: Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot Rolled	
1 in.	61	3 in.	46
1 1/4 to 1 1/2 in.	53	3 1/2 to 3 3/4 in.	48
1 1/2 in.	57	4 in.	51
2 to 2 1/4 in.	52	4 1/2, 5 and 6 in.	40
2 1/2 to 3 in.	40		

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads).....	55
Carbon, 0.30% to 0.40% base.....	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Metal Markets Quiet— Tin Active on Curtaiment Report

NEW YORK, Aug. 11.

COPPER

Custom smelters of electrolytic copper have generally settled on a price of 7.50c. a lb., delivered Connecticut Valley, with only a small tonnage of business being placed in a quiet market. Meanwhile, primary producers are firmly maintaining 8c., delivered, as a minimum, which removes them from the market except for deliveries to their own associated consumers. The price of Copper Exporters, Inc., is unchanged at 8c. a lb., c.i.f. usual European ports, which is on a basis of 7.75c. delivered, in the domestic market. With most of the current small domestic sales being made at 7.50c., delivered, foreign buyers are inclined to delay buying at the present export level in the belief that it represents too great a differential in the price. Yesterday, however, export sales totaled about 900 tons, but the total for the first 10 days of this month is only about 4000 tons. Statistics on production and stocks in July to be issued this week are expected to show an increase in stocks for the month in excess of 25,000 tons. Lake copper continues to be quoted at 8.12½c. a lb., delivered, which virtually removes sellers from the present market, but shipments are still being made on contracts.

TIN

Domestic prices throughout the week continued to show minor fluctuations in sympathy with the London market. On Friday and again on Monday there was substantial buying of tin by both dealers and consumers, who were influenced by the fact that only small quantities are being shipped from Singapore, the smelter there having suspended operation temporarily. The reduction in shipments from this source is attributed to overshipment of 2900 tons in the first five months of this year, so that a smaller movement will be necessary until the total permitted under the quota is adjusted. In certain cases purchases of tin have been made, not only for prompt shipment, but for delivery over the remainder of the year, November and December shipment being specified. The report that the Eastern smelter had exceeded its quota stimulated buying here on Saturday and in addition the London market had advanced on Friday by £2 a ton, as a result of group support. On

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Aug. 11	Aug. 10	Aug. 8	Aug. 7	Aug. 6	Aug. 5
Lake copper, New York.....	8.12½	8.12½	8.12½	8.12½	8.12½	8.12½
Electrolytic copper, N. Y.*.....	7.25	7.25	7.25	7.25	7.25	7.25
Straits tin, spot, N. Y.	25.12½	25.12½	...	24.87½	24.25	24.37½
Zinc, East St. Louis.....	3.82½	3.82½	3.85	3.85	3.85	3.85
Zinc, New York.....	4.17½	4.17½	4.20	4.20	4.20	4.20
Lead, St. Louis.....	4.22½	4.22½	4.22½	4.22½	4.22½	4.22½
Lead, New York.....	4.40	4.40	4.40	4.40	4.40	4.40

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.

Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.

Antimony, 6.60c. a lb., New York.

Monday, the London market again advanced, this time by £1 17s. 6d. a ton, but in the afternoon the price dropped 10s. a ton, and today there was a further reduction of 7s. 6d. a ton. Spot standard is now quoted at £111 12s. 6d. a ton, future standard is £114 2s. 6d. and Straits standard is £112 17s. 6d. The Singapore price is £117 15s. a ton. Stocks of tin in British warehouses at London and Liverpool have increased 61 tons to 31,697 tons, despite a shipment of 52 tons to the United States. Shipments of Straits tin to Aug. 8 totaled 1112 tons.

LEAD

Producers are well booked with tonnage for August shipment, but have sold little for September and beyond, although statistics are expected to show a further reduction of stocks of lead in July, as a result of substantial shipments during the month. The

price continues firm at 4.22½c., St. Louis, and 4.40c., New York, and sellers point out that there is no possibility of foreign lead appearing in the present market with the London price equivalent to 4.73c., New York.

ZINC

Prices developed slight weakness on Monday, with small sales made at a 2½ point reduction to 3.82½c., East St. Louis, and 4.17½c., New York. Sellers have generally met this situation, and are making small sales at the lower price to regular customers, but are not pressing for business. Some curtailment of zinc output is expected during the current month and with shipments for the month at about the July level, it is suggested that there should be a further reduction of stocks. Practically all present business is for prompt shipment, neither consumers nor producers

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	15.50c.
*Copper, hot rolled, base sizes.....	17.62½c.
Seamless Tubes—	
Brass	20.25c.
Copper	20.12½c.
Brass Rods	13.62½c.
Brazed Brass Tubes.....	24.25c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks 9.25c. to 9.50c.	
Zinc sheets, open.....	10.25c. to 10.50c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig.....	27.00c. to 28.00c.
Tin, bar	29.00c. to 31.00c.
Copper, Lake	9.75c. to 10.75c.
Copper, electrolytic	9.25c. to 9.75c.
Copper, casting	9.00c. to 9.50c.
Zinc, slab	5.00c. to 5.50c.
Lead, American pig.....	5.25c. to 6.25c.
Lead, bar	7.00c. to 8.00c.
Antimony, Asiatic	9.50c. to 10.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure).....	20.00c. to 22.00c.
Alum. ingots, No. 12 alloy	19.00c. to 21.00c.
Babbitt metal, commercial grade	20.00c. to 30.00c.
Solder, ¼ and ½.....	17.50c. to 18.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig.....	29.50c.
Tin, bar	31.50c.
Copper, Lake	9.13c.
Copper, electrolytic	8.62½c.
Copper, casting	8.50c.
Zinc, slab	5.50c. to 5.75c.
Lead, American pig.....	5.25c.
Lead, bar	7.75c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade.....	15.00c.
Babbitt metal, high grade.....	34.00c.
Solder, ¼ and ½.....	19.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (All prices are nominal because of uncertain condition of market.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.00c.	6.75c.
Copper, hvy. and wire	5.75c.	6.50c.
Copper, light and bottoms	4.75c.	5.50c.
Brass, heavy.....	3.25c.	4.00c.
Brass, light.....	2.50c.	3.50c.
Hvy. machine composition	4.75c.	5.50c.
No. 1 yel. brass turnings	3.50c.	4.25c.
No. 1 red brass or compos. turnings..	4.25c.	5.00c.
Lead, heavy	3.25c.	3.75c.
Zinc	1.50c.	2.00c.
Sheet aluminum.....	9.25c.	11.25c.
Cast aluminum.....	3.50c.	5.50c.

showing much interest in entering into obligations for forward delivery.

ANTIMONY

Importers are generally quoting the Chinese metal at 6.60c. a lb., duty paid, New York, for prompt shipment and 6.50c., duty paid, New York, for September or October delivery. Only a minor tonnage of new

business is being booked by importers, who point out that July shipments of antimony from China to the United States totaled only 250 tons, about 25 per cent of the usual requirements. Part of this curtailment is attributed to increased activity of the Texas smelter, which is producing antimony from Mexican ore and meets the Chinese delivered quotation.

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FABRICATED STRUCTURAL STEEL

**Awards Total 30,000 Tons—New Projects of 26,000 Tons
Include 7000 Tons for Long Island Bridges**

AWARDS of fabricated structural steel, at 30,000 tons, show an increase this week. They were 14,500 tons a week ago. The average weekly awards, as reported in 32 issues of THE IRON AGE this year, were 40,484 tons. Included this week are 7500 tons for a power transmission line from Peoria, Ill., to Chicago, 3800 tons for hydroelectric construction in Canada and 950 tons for a high school in Milwaukee.

New projects of 26,000 tons compare with 32,500 tons a week ago and 55,000 tons two weeks ago. New projects include 7000 tons for two highway bridges to Shelter Island from Greenport and Sag Harbor, N. Y., 5000 tons for a Post Office in Bay City, Mich., 2000 tons for an auditorium in Kansas City, Mo., and 2200 tons for three highway bridges at Joliet, Ill. Awards follow:

North Atlantic States

BOSTON, 395 tons, Shawmut Avenue bridge, to McClintic-Marshall Corp.

STEWARTSTOWN, N. H., 170 tons, almshouse, to Federal Iron Works, Boston.

CAMBRIDGE, MASS., 107 tons, underpass at end of Harvard Bridge, to McClintic-Marshall Corp.

STATE OF MAINE, 100 tons, three State bridges, to Kittredge Bridge Co., Concord, N. H.

WEYMOUTH, MASS., 100 tons, standpipe, to Tippet & Wood.

OAK TREE, N. Y., 125 tons, bridge for Lehigh Valley Railroad, to McClintic-Marshall Corp.

FAYETTEVILLE, N. Y., 300 tons, high school, to Syracuse Engineering Co.

NEW YORK CENTRAL RAILROAD, 360 tons, grade crossing elimination, East Syracuse, N. Y., to American Bridge Co.

STATE OF NEW YORK, 635 tons, highway bridge, Schuyler and Yates Counties, to Lackawanna Steel Construction Corp.

STATE OF NEW YORK, 100 tons, highway bridge, Columbia County, to American Bridge Co.

NEW YORK, 125 tons, additional steel for Metropolitan Life Insurance Building, to McClintic-Marshall Corp.

NEW YORK, 500 tons, columns for Post Office, to Fort Pitt Bridge Works Co.

NEW YORK, 600 tons, building on West Fortieth Street for National Screen Service, Inc., to McClintic-Marshall Corp.

NEW YORK, 300 tons, rectory for Church of the Paulist Fathers on West Fiftyninth Street, to Hinkle Iron Works.

NEW YORK, 150 tons, building at Thirtieth Street and Seventh Avenue for Metropolitan Temple, to La Cour Iron Works.

FREEPORT, N. Y., 385 tons; 215 tons for Columbus Avenue grade school and 170 tons for Albany Avenue grade school, both to Jay Klein Iron Works.

NEWARK, N. J., 200 tons, New Jersey Bell Telephone Co. building, to Hudson Structural Iron Works, Inc.

PHILADELPHIA, 175 tons, garage and storage building for Boyertown Casket Co., to Richard DeCou Co.

PENNSYLVANIA RAILROAD, 100 tons, bridge at Crafton, Pa., to American Bridge Co.

PHILADELPHIA, 200 tons, Logan Street bridge, to Phoenix Bridge Co.

PITTSBURGH, 300 tons, Islam Grotto, to Guibert Steel Co.

ERIE, PA., 325 tons, Post Office, to Erie Steel Construction Co.

Central States

MILWAUKEE, 950 tons, Solomon Juneau High School, to Worden-Allen Co.

MILWAUKEE, 600 tons, bridges for Milwaukee Electric Railway & Light Co. grade separation project, distributed among five local fabricators.

CHICAGO, 280 tons, plant for Pressed Steel Car Co., to Austin Co.

CHICAGO, 7500 tons, power transmission line from Peoria, Ill., to Chicago, distributed as follows: 1600 tons to Gary Structural Steel Co., 2950 tons to Blaw-Knox Co., and 2950 tons to Aeromotor Co.

CHICAGO, 650 tons, Jefferson Electric Co., to Austin Co., Cleveland.

CHICAGO, 250 tons, Commonwealth Edison Co., to Vierling Steel Works.

CHICAGO, 100 tons, miscellaneous railroad work, to Vierling Steel Works.

PARK RIDGE, ILL., 100 tons, school, to Duffin Iron Co., Chicago.

ST. LOUIS COUNTY, MO., 700 tons, bridge, to Stupp Brothers Bridge & Iron Co.

ST. LOUIS, 6800 tons, Meramec River bridge, to Stupp Brothers Bridge & Iron Co.

Canada

OTTAWA, ONT., 3800 tons, Hydroelectric Commission, to Canadian Bridge Co.

Mexico

MEXICO CITY, 1410 tons, assembly plant for Ford Motor Co., to a subsidiary of Monterrey Iron & Steel Co.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

BOSTON, 325 tons, Brighton district intermediate school.

WINCHESTER, MASS., 100 tons, two schools.

WORCESTER, MASS., 2800 tons, memorial building, previously reported as 2000 tons.

NEW YORK, 1200 tons, vocational school, Staten Island; Royal Rice Co., Inc., contractor.

PINE AIR, N. Y., 600 tons, building for Pilgrim State Hospital.

SUFFOLK COUNTY, N. Y., 7000 tons, two highway bridges from Sag Harbor and Greenport to Shelter Island.

CHESTER, PA., 250 tons, school at Eighth and Central Avenues.

BRIDGETON, N. J., 100 tons, City Hall.

TRENTON, N. J., 750 tons, Post Office and Court House.

PITTSBURGH, 450 tons, store for Richman Brothers Co.; bids on general contract taken Aug. 10.

PITTSBURGH, 500 tons, Jewish Home for Aged at Hazlewood.

The South

CLARKSBURG, W. VA., 700 tons, Court House.

Central States

TOLEDO, 270 tons, building for International Harvester Co.

BAY CITY, MICH., 500 tons, Post Office.

PARK RIDGE, ILL., 150 tons, public school.

JOLIET, ILL., 2200 tons, three highway bridges.

CHICAGO, 45,000 tons, Post Office; John Griffiths & Son Co., Chicago, low bidder on general contract.

WEST ALLIS, WIS., 500 tons, Allis-Chalmers Mfg. Co.

ST. PAUL, MINN., 5000 tons, Post Office.

KANSAS CITY, MO., 2000 tons, auditorium.

CHICAGO, 4000 tons, viaduct on Mannheim Road. New bids to be opened Aug. 24.

Western States

PORTLAND, ORE., 700 tons, Federal building.

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Preliminary estimates of production of coal and beehive coke, compiled by the United States Bureau of Mines, show totals for July of 29,653,000 net tons of bituminous coal, 3,948,000 net tons of anthracite coal and 73,300 net tons of beehive coke. These compare with revised figures for June of 29,185,000 tons of bituminous, 4,544,000 tons of anthracite and 87,300 tons of beehive coke.

British Shipbuilding Prospects Improve with New Contracts at Clyde Yards

(By Cable)

LONDON, ENGLAND, Aug. 10.

BUSINESS has improved slightly, but confidence is still lacking and a real revival of trade is not generally expected until fall. Meanwhile, Clyde shipbuilding prospects are improving and contracts have been awarded for three cargo vessels with orders for five more expected soon.

German mills have secured a total of 6250 tons of steel railroad ties for South African railroads, part of an order for 9250 tons placed on the Continent despite keen competition from United Kingdom mills.

At the annual meeting of the South African Iron & Steel Industrial Corp'n. it was stated that the corporation owns two iron ore deposits. One is near Pretoria, and is estimated to contain 48,000,000 tons of ore of about 45 per cent iron and high in silica. The other, near Vliegpoort on the Crocodile River, is stated to contain about 100,000,000 tons of very pure hematite ore, analyzing 68 per cent iron.

It was claimed at the meeting that the ore can be delivered to furnaces at Pretoria at under 10s. (\$2.43) a ton. Based on a charge consisting of 80 per cent hematite and 20 per cent silicious Pretoria ore, it was stated that good pig iron could be made at a cost of less than 30s. (\$7.30) a ton.

It was further claimed that the plant will be able to produce steel ingots at a cost of 51s. (\$12.40) a ton. Machinery and other equipment will be installed next spring. The total cost is placed at £5,489,000 (\$26,676,540).

German mills to furnish steel ties to South African railroads.

* * *

South African steel plant at Pretoria expects to make pig iron for about \$7.30 a ton and steel ingots for about \$12.40 a ton.

* * *

Dismissal notices issued by 1000 German plants to about 500,000 employees.

* * *

Japan's steel imports in first half only 32 per cent of same period in 1930.

▼ ▼ ▼

The Cologne, Germany, plant of the Ford Motor Co. has been closed temporarily, and the Opel Motor Works, near Frankfurt, subsidiary of General Motors Co., is now on half time.

The Polish Laurahutte is planning to suspend operation of additional rolling mills, a move that will affect about 500 workers.

In the British pig iron market, consumers of Cleveland iron are pressing for price reductions, but furnaces still refuse concessions except on special sales to Scotland. Buying of hematite iron is small, but sellers are less inclined than a few weeks ago to grant concessions and are asking increases for forward delivery.

The finished steel market here is

dull, especially for export, and mills are encountering considerable difficulty in arranging rolling schedules. Domestic inquiry for engineering and construction material is fair.

Continental mills are seeking tonnage from British consumers and are willing to shade prices whenever there is a favorable opportunity to book new business. Consumers of semi-finished steel have been attracted by low current prices of foreign material, but finished steel demand is small and the trend of prices is still downward.

Welsh tin plate mills are resuming operation and certain sellers are accepting 13s. (\$3.16) a base box, f.o.b. works port. Demand for tin plate is generally small, influenced largely by the European economic situation. Certain Welsh mills are in precarious condition, and it may become necessary for them to suspend operations completely.

Galvanized sheet demand is limited and with mills keenly competing for orders, prices have receded to a new low level of £9 2s. 6d. a ton (1.98c. a lb.) for No. 24 gage corrugated sheets in bundles. Certain sellers are willing to accept £9 a ton (1.95c. a lb.). Japanese buyers have placed small orders for light gage black sheets, but otherwise the market is quiet.

French production in June was 695,000 metric tons of pig iron with 89 furnaces in blast at the end of the month, and 649,000 tons of raw steel. Rolled steel output included 48,000 tons of railroad material, 71,000 tons of shapes, 23,000 tons of

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp with the £ at \$4.8665 (par)

British Prices, f.o.b. United Kingdom Ports							
Ferromanganese, export.	£9 0s.		\$43.74	Billets, Thomas.....	£3 3s.	to £3 4s.	\$15.31 to \$15.55
Billets, open-hearth.....	4 17½	to £5 5s.	23.69 to \$25.52	Wire rods, low C., No. 5			
Black sheets, Japanese				B.W.G.	4 15	to 5 0	23.09 to 24.30
specifications	10 0		48.66	Rails, light.....	6 0		29.20
Tin plate, per base box..	0 13¼	to 0 13½	3.22 to 3.28	Black sheets, No. 31			
			Cents a Lb.	gage, Japanese.....	11 5	to 12 12	54.68 to 58.32
Steel bars, open-hearth..	7 17½	to 8 7½	1.71 to 1.81	Steel bars, merchant....	3 7	to 3 8	0.73 to 0.74
Beams, open-hearth.....	7 7½	to 7 17½	1.60 to 1.71	Beams, Thomas, British			
Channels, open-hearth....	7 12½	to 8 2½	1.66 to 1.76	standard (nominal)...	3 7	to 3 8	0.73 to 0.74
Angles, open-hearth.....	7 7½	to 7 17½	1.60 to 1.71	Channels, Thomas, Amer-			
Black sheets, No. 24 gage	8 5	to 8 10	1.79 to 1.84	ican sections.....	5 12	to 5 14	1.24 to 1.26
Galvanized sheets, No. 24				Angles, Thomas, 4-in.			
gage	9 2½		1.98	and larger, over ½-in.			
				thick	3 7	to 3 7½	0.73 to 0.74
				Angles, Thomas, 3-in....	3 9	to 3 10	0.75 to 0.76
Continental Prices, f.o.b. Antwerp or Hamburg				Hoops and strip steel over			
Foundry iron, 2.50 to				6-in. base.....	4 5		0.94
3.00 per cent sil., 1.00				Wire plain, No. 8 gage..	5 0	to 5 1¼	1.09 to 1.10
per cent and more				Wire, barbed, 4-pt. No.			
phos.	£2 8s.	to £2 9s.	\$11.66 to \$11.91	12 B.W.G.....	8 10		1.87

wire rods, 13,000 tons of drawn wire, 19,000 tons of hoops, 15,000 tons of tubes, 13,000 tons of special and 155,000 tons of merchant steel bars, 8000 tons of tin plate, 42,000 tons of sheets thinner than 5 mm., 25,000 tons of plates, 5 mm. and heavier, and 5000 tons of flat billets.

Japan to Increase Tin Plate Output

YOKOHAMA, JAPAN, July 15.—The monthly tin plate capacity of the Seitetsu Jo (Government Steel Works) will be increased by 400 metric tons beginning Aug. 1. Although the stocks of tin plate in Japan are smaller than in the past, prices lack strength. Quotations on American tin plate have been reduced on recent offerings to a low of \$3.88 a base box, c.i.f. Japanese port.

Exports of German Locomotives Small

HAMBURG, GERMANY, July 29.—Exports of locomotives in the first half of this year are valued at only 10,000,000 m. (\$2,370,000), compared with 35,300,000 m. (\$8,366,000) in the first half of 1930. The greatest decline was in the heavier types, exceeding five tons. Builders do not see much prospect of improvement.

European Scrap Supplies Rapidly Diminishing

HAMBURG, GERMANY, July 29.—Stocks of steel scrap in various Continental countries, which were heavy at the end of last year, have been declining. This is attributed chiefly to the fact that small dealers in many districts are no longer collecting scrap at present low prices. In consequence, potential supplies in the various countries are still large, but available stocks of properly prepared scrap are at a minimum.

European Steel Sales Low in First Half

BERLIN, GERMANY, July 27.—Domestic and export steel business in European iron and steel producing countries declined considerably in the first half of this year, compared with the first half of 1930. Poland was the only exception, Polish exports showing an increase of 3 to 5 per cent, although domestic sales were only 20 to 25 per cent of the total in the same period of last year.

German domestic steel sales in the first half were about 45 per cent of

last year's, while exports were 24 to 25 per cent. Czechoslovakian domestic business was only 40 per cent of that in the first half of last year, and exports 18 to 20 per cent; British domestic sales 38 to 40 per cent, and exports about 40 per cent; Austrian 35 to 37 per cent, and exports 18 to 20 per cent; Hungarian 32 to 35 per cent, and exports 18 to 20 per cent; Belgian 28 to 30 per cent, and exports 22 to 24 per cent; and French 18 to 20 per cent, with exports at 25 to 28 per cent of last year.

Japanese Plan to Export 100,000 Tons of Steel

YOKOHAMA, JAPAN, July 15.—For the past six months and more the Seitetsu Jo (Government Steel Works) has been seeking means of selling its stock of steel products, totaling about 200,000 tons, mostly bars and shapes. The stock has now been reduced to about 100,000 tons, and a plan is being considered to dispose of this remainder, consisting of round, square and flat bars and angles, by selling to foreign consumers. To facilitate such sales in markets unfamiliar with Japanese quality, the government works is negotiating with a leading inspection organization to mark all these materials, which have been made to A. S. T. M. requirements.

German Works May Dismiss 500,000

HAMBURG, GERMANY, July 29.—The acute financial situation in Germany has resulted in an almost complete suspension of manufacturing business for the past three weeks. In consequence about 1000 manufacturers, small and medium-sized, have begun to reduce drastically the personnel of their plants, and in certain instances have given notice of dismissal to all employees preparatory to complete suspension.

In Germany, however, four to six weeks' notice is necessary to dismissal, and in certain quarters it is suggested that the suspensions just announced may not become effective in general as conditions should improve four to six weeks hence. Unless there is material improvement, however, present plans will undoubtedly be carried out and more than 500,000 operatives in industry will be affected.

An outgrowth of the present financial situation, which is causing inconvenience to German industry, is the charge of 100 m. (\$23.70) levied by the government for permission to travel abroad. This has affected the machinery industry, which is continually sending groups of skilled operatives to foreign markets for installation of German machines.

More Unemployment in German Steel Plants

HAMBURG, GERMANY, July 26.—The number of unemployed in the steel industry and associated metal-working fields continue to increase. With dismissals exceeding reemployment, there were 13,000 fewer operatives in these industries on June 30 than on April 1.

German Copper Output Increasing This Year

HAMBURG, GERMANY, July 29.—While production of lead and zinc in Germany declined about 40 per cent in the first half of this year, compared with the same period of 1930, copper output was slightly higher, totaling 60,987 tons in the first half, not including copper produced from imported ores. This total is about 4 per cent above the figure for the first half of last year.

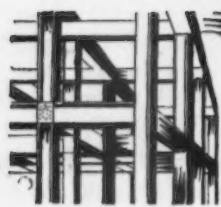
Japan's Steel Imports 32 Per Cent of 1930

YOKOHAMA, JAPAN, July 15.—Import statistics compiled by the Seitetsu Jo (Government Steel Works) show that steel arrivals at Japanese ports in the first half of this year totaled 71,047 metric tons, compared with 221,072 tons in the same period of 1930. The decline is attributed to decreased requirements by Japanese consumers and to continued efforts to reduce the use of foreign steel products.

Imports of steel bars and small angles totaled 4261 tons, compared with 33,148 tons in the first half of last year; beams and channels were 1483 tons, compared with 8210 tons in the first half of 1930; plates were 8232 tons, compared with 53,341 tons a year ago; tin plate 15,274 tons, compared with 31,529 tons; wire rods 27,658 tons, compared with 38,611 tons; sheet piling 5062 tons, compared with 17,474 tons, and pipe and tubes 4703 tons, compared with 14,942 tons, in the first half of last year.

General Drop Forge Co., Inc., 1738-1756 Elmwood Avenue, Buffalo, has appointed Copeland-Daniels, 2842 West Grand Boulevard, Detroit, its representative in Michigan, including the northwestern Ohio and northern Indiana territory.

Pittsburg Boiler & Machine Co., Pittsburg, Kan., has established an office in the Engineering Building, 205 Wacker Drive, Chicago, in charge of C. W. Waterman, vice-president.



PLANT EXPANSION AND EQUIPMENT BUYING



Stagnant Conditions Continue in Machine Tools

Business Has Shown No Improvement and No Signs of It Are in Sight

MACHINE tool business continues to be affected by the generally depressed conditions which are aggravated by plant shutdowns and absences of buying executives on vacations. The indication is that August sales totals may be smaller than those of July.

Although there are expectations that the coming of September will mark the end of the virtual stagnation of machine tool buying, definite signs

of a pickup are lacking. However, there are many dormant inquiries on which action may be taken when plant executives are back on the job, and particularly if general business improves at least seasonally beginning next month.

The depression evidently has brought fresh consideration of selling methods by machine tool companies, for in this week's news section are two items relating to changes in long-es-

tablished systems of distribution by two leading milling machine manufacturers. One company, which has been selling its machines direct in most of the important industrial centers, has appointed dealer representatives in the Central West, but its own factory men will work with these dealers. Another milling machine company, which has long been committed to the policy of dealer representation, will sell direct in certain territories.

▲ ▲ ▲

NEW YORK

Machine tool buying continues at extremely low ebb, with nothing to indicate an early improvement, although expectations are entertained that a change for the better may come next month. Unless there is a pickup in orders before the end of this month, August sales records will be generally poorer than those of July. The prospective orders for the Brooklyn Navy Yard and the subway shops of the Board of Transportation are the only sizable business in sight. The Navy Yard is expected to buy 17 lathes and a few other tools very shortly, while bids will be received late this month for the subway equipment, which includes about 50 metal-working and wood-working machines.

NEW ENGLAND

New inquiries have dropped off and most of those on which quotations have been received are still inactive. In the used tool market sales are few and mostly of small lathes or bench equipment.

MILWAUKEE

Some encouragement is found in a slight increase of new business booked during the first week of August. There still is no indication that buying is other than such as is dictated by urgent replacement needs, for the dearth of new plant construction or extension continues to be impressive. The aggressive effort to in-

duce users to modernize equipment at this time is bearing some fruit.

CLEVELAND

Machine tool business continues light, with orders confined to single items. Dealers and manufacturers have no expectation of any improvement in August, but look for some gain in September. The Cleveland Planer Co. has taken an order for a 72 x 72-in. x 30-ft. openside planer from the New York Shipbuilding Corp. for machining armor plate. Firestone Tire & Rubber Co., Akron, has an inquiry out for a 52-in. boring mill.

Timken Roller Bearing Co., Canton, has an order from the Pennsylvania Railroad for bearings for 150 electric locomotives, to be used between Washington and New York, which amounts to about \$400,000.

PITTSBURGH

Many buying executives are on vacation this month and scarcely any placing of orders is reported. A little inquiry is coming out from time to time, most of it resulting from the activity of salesmen rather than any desire on the part of buyers to add to their equipment. No further improvement is expected this month, but a number of important buyers are thought to be planning inquiries to be issued in September which will result in better business during the fall.

Announcement by Spang, Chalfant & Co., Pittsburgh, that it will build an

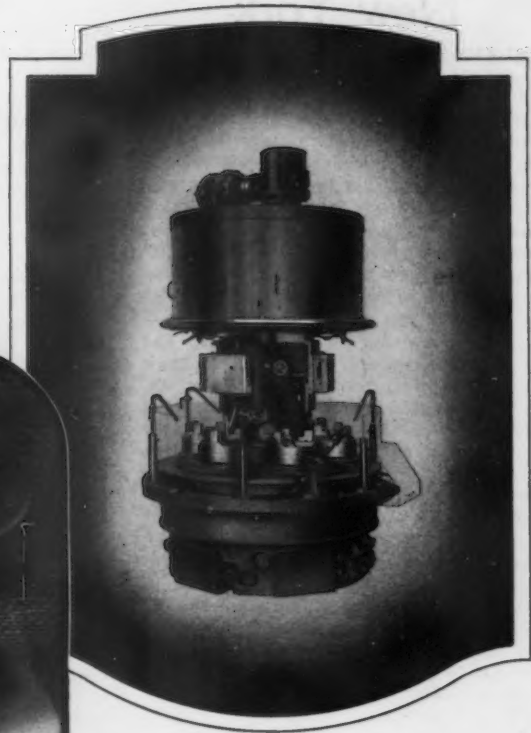
experimental unit at Ambridge, Pa., for manufacture of electrically-welded pipe is the only development of interest in the heavy equipment field. It is understood that most of the required equipment and machinery has been tentatively placed.

CHICAGO

Drift of this market is indicated by a slowing down of inquiries and the difficulty in closing against old requests for prices. Among recent purchases is a Monarch lathe by the University of Chicago, which also has bought a few used tools, closing a small list that has been before the trade for several months. There is still a good demand for used machines, but buyers are not willing to take old equipment that is out of date in design. Few of the more modern tools are being offered, with the result that sales are not as numerous as inquiries would seem to indicate.

CINCINNATI

With the vacation season in full swing and one or two local plants closed, the machine tool market is quieter than a week ago. Single orders, generally for small machines, continue to drift in, keeping operations at about 30 per cent of normal. Inquiries are becoming scarcer. Manufacturers, however, still have a large number of quotations outstanding which are being held up because of financial conditions.



—+—
BULLARDS MAY
BE PURCHASED
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The Mult-Au-Matic makes intensive use of productive time by performing multiple operations at effective feeds and speeds for each cut, yet simultaneously multiplied to include all cuts on the piece.

Thus, "The Method" provides maximum earning capacity at substantially lower production cost.

Details submitted upon request.

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Bridgeport, Conn.

New York

PLANS have been filed by Tide Water Oil Co., 17 Battery Place, New York, for new gasoline cracking coil unit at Bayonne, N. J., to cost \$130,000 with equipment, and one-story operating unit for auxiliary service to cost \$25,000.

Modern Metal Stamping & Novelty Co., Brooklyn, care of Michael Tursi, 2404 Pacific Street, recently organized by Mr. Tursi and associates with capital of \$20,000, plans operation of local factory for manufacture of stamped metal novelties and kindred products.

Ovens, power equipment, conveying and other machinery will be installed in new baking plant to be built by Great Atlantic & Pacific Tea Co., 420 Lexington Avenue, New York, on site adjoining branch plant at Youngstown, Ohio, to be three stories, 100 x 200 ft., to cost \$300,000. Bids have been asked on general contract.

Diamond Match Co., 30 Church Street, New York, is negotiating for purchase of plant and properties of Saranac Pulp & Paper Co., Inc., Plattsburgh, N. Y., valued in excess of \$1,500,000, and will use for expansion. Acquisition will include a long-term power contract with Saranac River Power Corp., for power supply at plant.

New York Edison Co., 4 Irving Place, New York, is planning steel tower transmission line through Westchester County to connect with high-tension system of Niagara-Hudson Power Corp., Buffalo, at point south of Poughkeepsie, to cost over \$500,000 with power substation and switching facilities.

Board of Transportation, 250 Hudson Street, New York, is asking bids until Aug. 18 for rails, frogs, switches and other equipment for municipal rapid transit railway system. Francis J. Sinnott is secretary.

Plans have been filed by William Shary, 22 East Seventeenth Street, New York, architect, for a three-story automobile service, repair and garage building, 92 x 100 ft., to cost \$115,000 with equipment.

New York Steam Corp., 280 Madison Avenue, New York, a subsidiary of Consolidated Gas Corp., 4 Irving Place, is considering expansion and improvements in steam generating and distributing plants, pipe lines, etc., to cost more than \$2,500,000. Company has recently secured contract for central steam service for all Federal buildings in city.

Ledkote Products Co., Everett, Mass., manufacturer of lead specialties, mechanical products, etc., has leased building at 38-13 Twenty-third Street, Long Island City, N. Y., for new factory branch and distributing plant.

Board of Education, City Hall, Newark, N. J., will install manual training equipment in new three and four-story high school in Weequahic Park section, to cost \$1,080,000, for which bids will be received on general contract until Sept. 10. Guilbert & Betelle, Chamber of Commerce Building, are architects.

Passaic Valley Water Commission, 156 Ellison Street, Paterson, N. J., is re-advertising for bids until Aug. 17 for three fixed-blade turbo-generator units, each of 600-kw. capacity, and one automatically adjustable-blade turbo-generator of 600-kw. rating. Fuller & Everett, 25 West Forty-third Street, New York, are consulting engineers.

Board of Water Commissioners, Eliza-

beth, N. J., has authorized purchase of equipment for engineering department of City Water Department, including pipe, meters and accessory equipment. S. F. Newkirk, Jr., is water engineer.

J. G. Helmers, 147 Summit Avenue, Union City, N. J., architect, has plans for a two-story automobile service, repair and garage building, to cost about \$125,000 with equipment.

Board of Education, Englewood, N. J., plans installation of manual training equipment in new two-story and basement senior and junior high school to cost about \$850,000, for which bids have been asked on general contract. Lawrence C. Licht, 4 North Dean Street, is architect.

Lever Brothers Co., 164 Broadway, Boston, manufacturer of soaps, washing fluids, etc., is completing plans for remodeling and improving factory recently acquired at Edgewater, N. J., including new pier with mechanical-handling equipment, etc., to cost over \$1,000,000 with machinery. Company is controlled by Lever Brothers, Ltd., London, England. Stone & Webster, Inc., Boston and 90 Broad Street, New York, is architect and engineer.

Board of Education, Teaneck, N. J., contemplates installation of manual training equipment in new three-story high school, for which bids will soon be asked on general contract, to cost about \$600,000. Hacker & Hacker, 201 Main Street, Fort Lee, N. J., are architects.

Philadelphia

PLANS have been approved by Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, for a new power substation, to cost over \$2,300,000 with equipment. Initial unit will cost about \$1,000,000. Unit will be used primarily in connection with supply of power to Pennsylvania Railroad.

Norbom Engineering Co., Fifth and Ellis Streets, Darby, Pa., manufacturer of boring machinery, dredges and heavy machinery, plans rebuilding part of plant recently destroyed by fire, with loss close to \$50,000 including equipment.

Samuel Osterneck, 515 South Melville Street, Philadelphia, and associates have organized Ontario Metals Refining Co., to operate a metal smelting and refining plant.

Philadelphia Gas Works Co., 1401 Arch Street, Philadelphia, has approved plans for two new artificial gas storage and distributing holders, each with capacity of 10,000,000 cu. ft., to cost about \$1,000,000 with equipment.

Department of City Transit, City Hall Annex, Philadelphia, C. E. Myers, director, will receive bids until Aug. 25 for automatic signalling and interlocking equipment for Ridge Avenue subway.

Quaker Products Co., Fourth Street and Railroad Avenue, Philadelphia, is planning to rebuild part of meat-packing plant recently destroyed by fire, with loss of over \$200,000 including equipment.

C. V. Hill & Co., Pennington Avenue, Trenton, N. J., manufacturers of refrigerators, are considering an extension to metal-working and blacksmithing department to triple present size, and a new one-story unit for porcelain enamelling, to cost over \$85,000 with equipment.

Company has work under way on a three-story and basement factory addition, costing about \$70,000.

Holly Gap Paper Co., Inc., Mount Holly Springs, Pa., recently organized by Samuel E. D. Fry and Harry A. Buttorff, Mount Holly Springs, and associates, plans operation of local paper mill for production of book and machine finish stocks. Company will take over an existing plant and carry out expansion. Mr. Fry, heretofore superintendent at local mill of Holly Glen Paper Mill, will be president of new company.

Board of Trustees, Hershey Industrial School, Hershey, Pa., is planning group of new buildings to accommodate close to 1000 additional students, including a new industrial and vocational shop. Entire project will cost over \$1,000,000 with equipment.

Atlantic Oil Producing Co., an interest of Atlantic Refining Co., 260 South Broad Street, Philadelphia, has purchased properties of Cranfill-Reynolds Oil Co., consisting of over 1000 acres of oil lands in east Texas oilfields, and will carry out expansion for additional crude oil supply for plant at Port Arthur, Tex.

South Atlantic

PLANS have been filed by Baltimore Ship Repair Co., 821-23 Key Highway, Baltimore, for a one-story shop addition, 30 x 70 ft., to cost about \$40,000 with equipment.

Chemical Warfare Service, Edgewood Arsenal, Md., is asking bids until Aug. 19 for a quantity of galvanized barrels.

Board of School Commissioners, Madison and Lafayette Avenues, Baltimore, is asking bids until Aug. 19 for furniture and equipment for various schools, laboratory supplies and miscellaneous school supplies. Specifications on file at office of Business Division of Board, 1230 East Twentieth Street.

Board of Trustees, Carnegie Institution of Washington, Sixteenth and P Streets, has plans for a new power station, 32 x 48 ft., to cost over \$65,000. William I. Deming, 808 Seventeenth Street, is architect; George A. Weschle, 726 Jackson Place, is engineer.

Board of District Commissioners, District Building, Washington, will receive bids until Aug. 20 for a quantity of cable.

Baltimore Buggy Top Co., Guilford Avenue and Chase Street, Baltimore, manufacturer of automobile tops, frames, etc., has leased two-story building at 1107 Cathedral Street for new plant and will remove to new location.

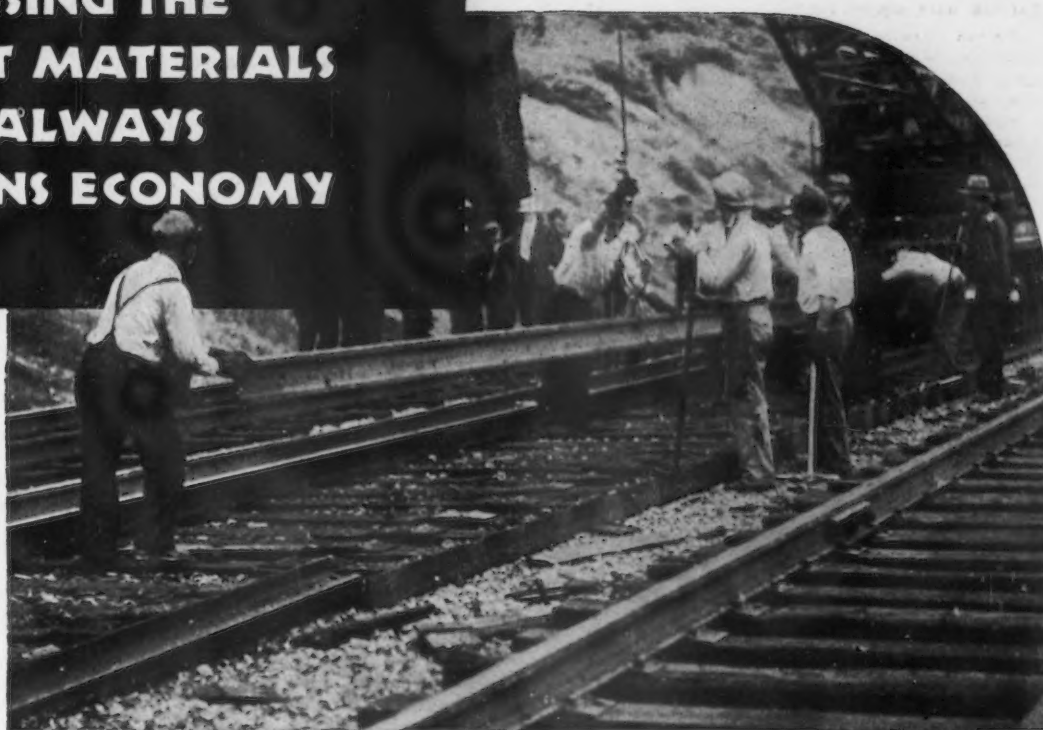
Board of Trustees, National Training School for Boys, Bladenburg Road, N. E., Washington, is asking bids on general contract for a one and two-story vocational training shop building, 40 x 122 ft., with wing extension, 35 x 55 ft., to cost over \$100,000 with equipment.

Pennsylvania Railroad Co., Baltimore, has authorized installation of an underground conduit system from Wilmington, Del., to Washington, by way of Baltimore, in connection with electrification of this portion of its system. Installation will include over 100 miles of conduit and will cost about \$7,000,000 including underground wires.

City Council, Brunswick, Ga., is planning special election to vote bonds for

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152-pound rails are being adopted as standard on the main lines of the Pennsylvania Railroad, replacing the old 130-pound rails. This photograph, taken a few miles east of Pittsburgh, shows the first of these 152-pound rails being laid on Century Creosoted Oak Ties.



When the Pennsylvania Railroad decided to install 152-pound rails a careful inspection of the Century Creosoted Ties indicated that it would not be necessary to install new ties. In fact, many of the old ties will still be capable of rendering service after the new heavy steel rails have been replaced—for the Century Creosoted Ties in the track illustrated will average 27 years of service.

Rarely is any material subjected to so grueling a test as are these Century Creosoted Ties. In their 27 years of service, they are exposed to all kinds of weather, blistering sun, beating rains and snow, withstanding the weight and sudden shock delivered year after year, as the pounding wheels of the Broadway Limited and the great fleet of other passenger and freight trains of the Pennsylvania speed, with safety and comfort, on to their destination—but try as they may these battering rams of time, strain, weight and sudden shock spend themselves harmlessly against resilient, shock-absorbing, long-lasting Century Treated Ties. Certainly here is the right material.

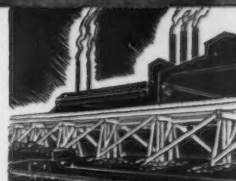
The economy of Century Preserved Forest Products demands careful consideration in every use where hard, long-time service is required.



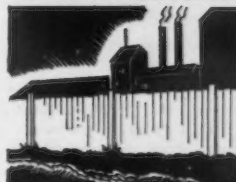
CENTURY WOOD PRESERVING CO.

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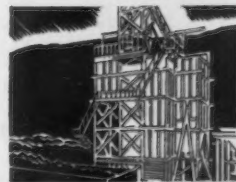
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LOADING PLATFORMS



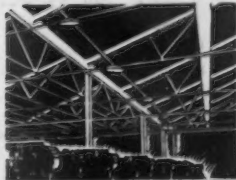
FENCES



STORAGE BINS



FLOORS



ROOF CONSTRUCTION

\$150,000 for a municipal airport, including hangars, repair shops and other field units.

Albemarle Fruit Packers, Inc., Charlottesville, Va., has work under way on a new fruit packing plant, to cost over \$40,000 with equipment.

United States Coast Guard Headquarters, Washington, will receive bids until Aug. 17 for two 300-hp. marine oil engines, one engine-driven generator and compressor set, one motor-driven air compressor, six air storage tanks, one fuel oil service tank, two lubricating oil filter tanks, two oil coolers, tools, etc., and 160,000 ft. of cable.

Charles J. Phillips, 1336 Greenmount Avenue, Baltimore, operating a stone-cutting and finishing plant, has plans for a two-story machine shop and tool works, 86 x 95 ft.

New England

PLANS are being completed by Lowell Electric Light Corp., Lowell, Mass., for new multi-story equipment storage and distributing plant, with service and repair departments, to cost about \$120,000 with equipment.

Walton L. Boyer, 57 Federal Street, Springfield, Mass., and associates have organized Aircraft Hardware Mfg. Co., to operate factory for manufacture of airplane hardware and equipment at or near New York. Oswald Mazzei, 466 Concord Avenue, New York, is interested in company.

State Department of Education, 14 Beacon Street, Boston, has plans for a two and one-half story nautical training school at Cambridge, Mass., with shops and other departments, to cost over \$1,200,000 with equipment. J. C. Spofford, 53 State Street, Boston, is engineer.

Plans are under way for a merger of Beardsley & Wolcott Mfg. Co., Waterbury, Conn., manufacturer of cabinet hardware, electric household appliances, etc., and Connecticut Electric Mfg. Co., Bridgeport, Conn., manufacturer of switches, cut-outs and kindred electrical equipment. A new company will be organized under direction of Industrial Managers, Inc., 1 Madison Avenue, New York, to take over both interests. Connecticut company has been operating under a receivership. It is proposed to remove Bridgeport works to Waterbury, where expansion will be carried out and production concentrated.

Board of Education, Dedham, Mass., contemplates installation of manual training equipment in addition to high school to cost about \$300,000, for which plans are being drawn by Edward T. P. Graham, 171 Newbury Street, Boston, architect.

Central Specialty Corp., Westfield, Mass., recently organized by Charles H. Spencer, West Springfield, Mass., and associates, plans operation of plant at first-noted place for production of machinery and parts. Mr. Spencer will be treasurer. S. Frederick Cushman, Westfield, is president.

School Committee, Cambridge, Mass., has authorized erection of an addition to Rindge Technical High School, including mechanical shops, laboratories, etc., to cost \$1,200,000 with equipment. Raymond A. Fitzgerald is vice-chairman of committee.

Buffalo

PLANS are under way by American Oxycop Co., Toronto, manufacturer of flame-cutting machines and parts, for removal of operations to Niagara Falls, N. Y., where initial work will be carried out at plant of Chrisholm-Ryder Co., Inc., College and Highland Avenues, manufacturer of agricultural tools. Ernest C. Crabtree is president.

Edward H. Baker, 121 Linwood Avenue, Buffalo, and associates have organized Ward Specialty Corp., to operate a plant for manufacture of internal combustion engines and parts. Charles F. Monroe, 178 Linwood Avenue, is interested in company.

Tri-State Oil & Gas Corp., Elmira, N. Y., has acquired a substantial interest in Bigelow Gas Corp., Rochester, N. Y., and Lamoka Power Corp., Sodus, N. Y., both operating natural gas wells in Wayne field. Purchasing company is arranging for change of name to Tri-State Gas & Electric Corp., and will carry out expansion for natural gas supply and distribution, including pipe lines, compressor plants, etc. Gale H. Stalker is president.

New York Central Railroad Co., 466 Lexington Avenue, New York, plans erection of new freight terminal at Syracuse, N. Y., to include installation of a 50,000-gal. steel water tank, two steel water columns, track scale units and other facilities. Project will cost about \$500,000 with equipment.

Koester-Green, Inc., Rochester, recently organized by Ralph S. Koester, 86 Falleson Road, Rochester, and Norman F. Green, Seville Drive, Irondequoit, N. Y., plans operation of factory for manufacture of electric lighting fixtures and equipment.

Pittsburgh

APPLICATION has been made by West Penn Power Co., West Penn Building, Pittsburgh, for Federal permission to build a power transmission line across Allegheny River, near Parker, Pa., using steel towers.

National Torch Tip & Machine Co., 1245 Washington Boulevard, Pittsburgh, manufacturer of mechanical equipment, has approved plans for new one-story factory, 50 x 80 ft., at Aspinwall, Pa., to cost about \$30,000 with equipment.

Department of Supplies, City-County Building, Pittsburgh, will receive bids until Aug. 17 for quantity of steel sign plates for Bureau of Traffic, one automatic cone valve and five automatic stop and check valves for Bureau of Water.

Board of Education, Arnold, Pa., has awarded general contract to A. H. Praeger, New Kensington, Pa., for a two-story manual training shop in connection with a new senior-junior high school, shop unit to cost close to \$50,000 with equipment.

Pennsylvania Electric Co., Johnstown, Pa., has arranged for a note issue to total \$9,000,000, part of proceeds to be used for expansion and improvements.

Officials of Blaw-Knox Co., Blawnox, Pittsburgh, have organized Blaw-Knox Pacific Co., with headquarters at San Francisco, to handle business on Pacific Coast and in Far East.

Board of School Directors, Monaca, Pa., is considering installation of manual

training equipment in new junior high school to cost over \$175,000, for which bids are being asked on general contract until Aug. 24. Stetson & Bradley, 719 Franklin Avenue, Aliquippa, Pa., are architects.

Crossley Co., Erie, Pa., has been organized by Edward Crossley, 456 West Fourth Street, and associates, with capital of \$15,000, to operate a local machine works for production and assembling of machinery and parts.

Chicago

CONTRACT has been let by Commonwealth Edison Co., 72 West Adams Street, Chicago, to George A. Fuller Co., 32 West Randolph Street, for superstructure for one four-story and one three-story additions to electric distributing plant, to cost over \$400,000 with equipment. H. V. von Holst, 79 West Monroe Street, is architect.

Woolcott Milling Co., Harrisburg, Ill., is planning to rebuild part of grain milling plant recently destroyed by fire, with loss of about \$100,000 including equipment.

Board of Public Welfare, City Hall, Minneapolis, Minn., has awarded general contract to E. G. Evensta Co., 2139 California Street, N. E., for one-story and basement industrial building, 130 x 150 ft., at city warehouse, to cost about \$65,000 with equipment. Croft & Boerner, Inc., 1004 Marquette Avenue, is architect and engineer.

Swift & Co., Chicago, have awarded general contract to W. A. Klinger, Warrick Building, Sioux City, Iowa, for two-story and basement addition to packing plant at Sioux City, to cost about \$90,000 with machinery.

State Highway Department, Capitol Building, Cheyenne, Wyo., has plans for a one-story mechanical and industrial shop, 80 x 100 ft., at Casper, Wyo., to cost about \$35,000 with equipment. Goodrich & Krusmark, Turner-Cottman Building, Cheyenne, are architects.

Iowa Electric Co., Cedar Rapids, Iowa, is planning erection of a hydroelectric power house at Anamosa, Iowa, to cost close to \$100,000 with transmission system.

Cascade County Road Department, Great Falls, Mont., Harold B. Lockhart, County surveyor, is arranging list of equipment to be purchased, subject to approval of Board of Cascade County Commissioners, including valve grinding machine, emery wheel and stand, one bulldozer, trailer for shovel, road grader, scrapers, small tools, etc., to cost \$21,678.

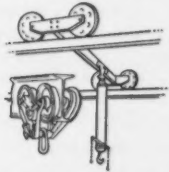
Old Colony Coal Co., 200 South First Avenue East, Duluth, Minn., has plans for a new fuel briquet manufacturing plant, with elevating, conveying, loading and other mechanical-handling equipment, to cost close to \$200,000.

City Council, Colchester, Ill., plans installation of a 75,000-gal. steel storage tank, centrifugal pumping machinery and other equipment in connection with extensions and improvements in municipal waterworks. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, is engineer.

American Manganese Steel Co., 333 North Michigan Avenue, Chicago, is considering erection of new branch plant, including foundry unit, at Montreal, where

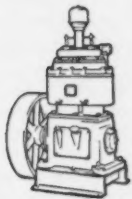
CURTIS I-BEAM AIR CRANE

Has 10 to 40-foot span,
 $\frac{1}{2}$ to 10-ton capacity
Roller bearing, easily
handled. Requires no
special operator; success-
fully operated by any
workman, especially
with Curtis Air Hoists.



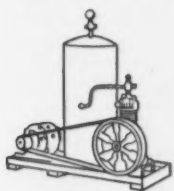
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Has large wheels, roller
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frame and other features
to make it unusually
easy running.



CURTIS COMPRESSOR

Sizes 3 to 50 h.p. Tim-
ken bearing equipped
Water cooled. Curtis
new Centro-ring lubri-
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lowest oil consumption
with certainty of safe
lubrication. Unloader
regulates air pressure.
Bypass valve permits
starting unloaded. "Car-
bon Free" valve design
insures greater efficiency.



CURTIS PAINT SPRAY COMPRESSOR

Sizes $\frac{1}{4}$ to 5 h.p.
Single or two-stage.
Automatic control. Rec-
ommended by leading
manufacturers of spray
guns. Centro-ring lubri-
cation prevents clogging
of filters, minimizes
chance of lubricating oil
getting into air lines to
ruin the paint job.



Economy! . . . Curtis Air Hoist
costs one-fifth that of other power
hoists; no more than a chain block.

When first cost or cost of operation is considered (in-
cluding power, labor, depreciation and servicing) Curtis
Air Hoists prove their greater economy over other types.

But aside from economy, Curtis Air Hoists, because of
their simplicity and accuracy (only one moving part)
have positive advantages and are your logical choice
if your hoisting involves any of these eight conditions:

1. If ordinary labor handles hoists.
2. If over-loading is likely to take place.
3. If hoist failure means costly stops.
4. If accuracy of spotting is important.
5. If gentle handling of load is needed.
6. If horizontal motion is required.
7. If atmospheric conditions are bad.
8. If outdoor operation is a factor.

Write for Curtis catalog of air hoists and industrial equipment.
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CURTIS

AIR HOISTS

property is being acquired, to cost over \$1,000,000 with equipment. Output will be given over primarily to manganese steel castings, machine parts and special alloy castings.

Harry L. and Harry H. Steeb have incorporated Nonferrous Castings Corp., with \$5,000 capital, and for the present will be located with Steeb Pattern Co., Twenty-second Street and First Avenue, Moline. Plans are under way for expansion.



Cleveland

PLANS are under way by Patterson Foundry & Machine Co., St. George Street, East Liverpool, Ohio, for a new electric generating plant, to cost close to \$75,000 with equipment. Albert D. Birch, plant manager, will be in charge.

Eastern Ohio Sand & Supply Co., East Liverpool, Ohio, has secured permission for construction of two steel bins and auxiliary equipment at Port Homer on Ohio River.

Willard Metallic Vault Co., Willard, Ohio, is planning expansion, including installation of additional equipment, to cost about \$25,000.

Board of County Commissioners, Court House, Cleveland, is planning to ask bids in September on a two-story equipment storage and distributing plant, 100 x 180 ft., to cost over \$120,000 with equipment. Philip L. Koklauner, Court House, is engineer.

Automatic Mechanical Stoker Corp., Canton, Ohio, care of Clayton Hoffman, Harter Bank Building, recently organized by J. L. and E. E. Hinderer, Canton, and associates, plans operation of local works for manufacture of mechanical stokers, including parts and assembling.

Goerlich's, Inc., 1213 Norwood Avenue, Toledo, Ohio, manufacturer of automobile heaters, mufflers and other automotive equipment, is considering erection of a new plant, to cost over 100,000 with equipment.



Milwaukee

PLANT of Twentieth Century Machinery Co., 1015 South Fourth Street, Milwaukee, manufacturer of bottling machinery, was wrecked by fire early Aug. 4. Extent of damage to tools and other equipment is not yet determined. Company expects to lease new quarters and resume business as rapidly as possible. Henry Scarborough is president and manager.

Hudson Mfg. Co., Minneapolis, Minn., manufacturer of steel sanitary barn equipment and fixtures, is placing contracts for an extension to branch plant at Oshkosh, Wis.

George L. Kohn, vice-president of defunct Esline Co., Milwaukee and Oconomowoc, Wis., manufacturer of portable steel structures, has purchased physical assets of company and organized S-Line Corp., to continue business at Oconomowoc, enlarging line by addition of other sheet products. Mr. Kohn is president, Elmer Weber, vice-president.

Board of Education, Plymouth, Wis., has engaged M. Tullgren & Sons Co., 1234 North Prospect Avenue, Milwaukee, to design new \$250,000 Senior-Junior High School, to contain vocational shops.

Board hopes to be able to take bids and award contracts by Nov. 1. Mrs. Paul Wagner is secretary.

Neldner Valves Corp., Milwaukee, is rounding out equipment of its new plant at 2484 South Seventh Street with view toward quantity production of newly developed self-lighting gas stove and range valve.

Common Council, Hartford, Wis., has accepted bid of John Thorn, local contractor, for addition to municipal sewage disposal plant.

American Pattern & Mfg. Co., 1620 Junction Avenue, Racine, Wis., has organized as a corporation under same title. Besides wood and metal patterns, company manufactures tools, dies, jigs, fixtures, etc. Principals are Hans A. Nelson, founder of business, T. B. Nelson, E. J. and E. E. Beck.



Detroit

PLANS will be drawn by Baker Auto Parts Co., Grand Rapids, Mich., manufacturer of automobile parts and equipment, for a new one-story plant on site recently acquired at Muskegon, Mich., to cost close to \$35,000 with equipment.

Chrysler Corp., 341 Massachusetts Avenue, Detroit, has awarded general contract to H. G. Christman & Burke Co., Fisher Building, for one-story L-shaped addition, 190 x 240 ft., at DeSoto and Plymouth motor car divisions, to cost about \$125,000 with equipment. Albert Kahn, Inc., Marquette Building, is architect and engineer.

George G. Eddy, Manistee, Mich., and associates have organized Century Boats, Inc., to operate a local boat-building and repair works. E. A. Doty, Manistee, is interested in company.

Board of directors, Michigan Cherry Growers' Association, Traverse City, Mich., is considering installation of conveying machinery, mechanical-packing and other equipment in new packing plant, to cost close to \$40,000 with machinery.

New Way Engine & Machine Co., Lansing, Mich., successor to New Way Motor Co., manufacturer of gasoline engines, parts and other specialties, has arranged for a stock issue to total \$250,000, part of fund to be used for general expansion.

Carl Cushman Co., Lansing, Mich., has plans for a new grain elevator, with elevating, conveying, screening and other equipment, to cost over \$75,000. Contract for superstructure has been awarded to Louis Miller, East Lansing.

Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, a unit of American Radiator & Standard Sanitary Corp., New York, has awarded general contract to P. H. Piper Co., Michigan Theater Building, Detroit, for a new two-story factory branch, storage and distributing plant, 72 x 292 ft., at Detroit, to cost about \$65,000 with equipment. Weston & Ellington, Stroh Building, Detroit, are architects and engineers.

Filter Condenser Corp., 1538 East Milwaukee Avenue, Detroit, recently organized, plans operation of local factory for manufacture of electrical and mechanical equipment. Otis K. Richard and Clement C. Richard head new company.

Cincinnati

CITY Manager Russel P. Price, Hamilton, Ohio, has awarded general contract to Georgenson Construction Co., 320 Webster Street, for one-story municipal electric light and power plant, 90 x 120 ft., to cost about \$200,000 with equipment. Froelich & Emery Engineering Co., Second National Bank Building, Toledo, Ohio, is engineer.

Columbus Battery Mfg. Co., Columbus, Ohio, care of I. L. Margulis, 83 South High Street, recently organized by Mr. Margulis and associates, plans operation of local factory for manufacture of storage batteries and equipment. H. A. Hecox, Columbus, is interested in company.

Kroger Grocery & Baking Co., 35 East Seventh Street, Cincinnati, has asked bids on general contract for a two-story top addition to storage and distributing plant, 140 x 374 ft., to cost over \$125,000 with equipment. Hunt & Allan, Eagle Savings Building, are engineers. Contract has been let to H. K. Ferguson Co., Cleveland, for one and two-story branch plant, storage and distributing building, 250 x 300 ft., at Carbondale, Ill., to cost about \$85,000 exclusive of handling and other machinery. Emil H. Niemann, 3816 Shaw Avenue, St. Louis, is architect for last-noted structure.

Contracting Officer, Wright Field, Dayton, Ohio, will receive bids until Aug. 17 for 20 hub assembly propellers; until Aug. 19 for 400 ball bearing control assemblies, lever assemblies, latches, engine control latch boss, springs, etc.; until Aug. 24 for 1300 container assemblies and 25 training parachutes, and until Aug. 25 for 16 generators.

National Gas Development Co., 506 Main Street, Carrollton, Ky., is planning installation of drilling machinery and other equipment in connection with development of natural gas properties in several counties.

McMahan & Cassilly Co., 933 West Main Street, Louisville, Ky., has been incorporated by R. McMahan and T. Cassilly to manufacture tools, dies and stampings.



Gulf States

IN connection with addition to mill of Southern Advance Bag & Paper Co., Inc., Hodge, La., now under way, to cost over \$100,000, parent organization, Advance Bag & Paper Co., 38 Newbury Street, Boston, will remove part of present paper mill at Howland, Me., to Hodge, where production of kraft and other heavy papers will be doubled. Company has contracted with Louisiana Power & Light Co., New Orleans, for additional power supply and new transmission line will be built from power station at Sterlington, La., to Hodge, about 25 miles, to cost close to \$90,000.

Texas Citrus Fruit Growers' Exchange, Mission, Tex., has awarded general contract to W. A. Velten, Brownsville, Tex., for a new fruit packing plant at San Carlos, Tex., to cost about \$75,000 with equipment. Conveying machinery, mechanical-packing and handling equipment will be installed. A similar packing plant is planned at Harlingen, Tex., to cost about \$80,000 with equipment.

Tidal Oil Co., operated by Tide Water Associated Oil Co., 17 Battery Place, New York, has purchased producing

51 YEARS YOUNG!

*A record of endurance that you
can better with Byers
Wrought Iron*

The city of Charleston, South Carolina, erected a 136,000-gallon standpipe, 'way back in 1880. They wanted permanence, durability—so they built their standpipe of wrought iron.

When the source of the municipal water-supply was changed in 1905, this 25-year-old standpipe was abandoned. There it stood, unused, for 14 years with no other attention than a single coat of paint. In this section of the country, the average life of less durably constructed tanks is from 15 to 20 years. But—this wrought iron standpipe resisted the corrosion of salt air, rain

and supply-water for 35 years.

And that isn't all. . . .

In 1919, the Hanahan pumping station, 14 miles away, needed a standpipe. It was estimated that a new standpipe would cost \$7500; but to tear down, re-erect, and paint this old one would total only \$4100. So—plate by plate—this 39 year-old standpipe was cut down and re-erected. With the exception of the bottom ring and the bottom plate, *every one of the original plates was used.*

That's wrought iron for you!

And Byers wrought iron plates give even better, longer service than those that were used in this standpipe for 51 years. Byers gives extra lasting quali-

ties to tanks, standpipes, conduits or bridge-plates.

"New highs" in wrought iron quality have been established by A. M. Byers Company since 1864. The most modern achievements in manufacture, chemistry and metallurgy are employed to make Byers Genuine Wrought Iron the enduring metal of 1931's corrosion problems.

We will gladly send you additional information on request; or, if you prefer, our engineers will suggest where the use of Byers Wrought Iron can add years of service to your next construction job. A. M. Byers Company, Pittsburgh, Pa. Established 1864.

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THESE ARE THE BYERS GENUINE WROUGHT IRON PRODUCTS

PIPE	NIPPLES	PLATE
TUBING	COUPLINGS	BAR IRON
CASING	WELDELLS*	BLOOMS
SPECIAL BENDING PIPE		

**Made from Byers Genuine Wrought Iron by the Locomotive
Terminal Improvement Company of Chicago.*

BYERS GENUINE WROUGHT-IRON PRODUCTS

properties of Mid-Kansas Oil & Gas Co., in Kilgore and Lathrop, Tex., district, including 25 producing wells, pipe line gathering system, bulk storage facilities, etc. Purchasing company plans expansion in connection with other holdings in same district.

W. P. Lincoln, Bossier City, La., has begun erection of new one-story plant, 110 x 225 ft., for manufacture of steel tanks and other plate products, to cost close to \$30,000 with equipment.

West Texas Utilities Co., Abilene, Tex., will build a new transmission line from a point near Vernon, Tex., to Lockett, Thalia and vicinity, about 20 miles, to cost about \$25,000 with equipment.

Danciger Oil & Refining Co., W. T. Waggoner Building, Fort Worth, Tex., has asked bids on general contract for a new oil refinery on site recently acquired near Longview, Tex., to cost close to \$200,000 with machinery. Company is now operating a refinery at Pampa, Tex., under name of Petroleum Refractionating Corp. Bell Oil & Gas Co., Tulsa, Okla., is interested in new project at Longview.

San Marcos Independent School District, San Marcos, Tex., plans installation of manual training equipment in new two-story combination high and elementary school to cost \$200,000, for which bids will be asked on general contract in September. Harvey P. Smith, National Bank of Commerce Building, San Antonio, Tex., is architect.

Alabama National Guard, 106th Observation Squadron Air Corps, Birmingham, has secured State appropriation of \$142,000 for erection of hangar with repair shop and administration building at municipal airport, for which plans will be drawn soon.

Tangipahoa Parish School Board, Amite, La., is considering installation of manual training equipment in new high school in School District No. 107, for which a fund of \$110,000 has been authorized. Favrot & Livaudais, Hibernia Bank Building, New Orleans, are architects.

Indiana

BOARD of Public Works, City Hall, Indianapolis, has plans for two municipal automobile service, repair and garage buildings at Ben Davis municipal airport.

Howard A. and August Visel, Elkhart, have organized Lux-Visel, Inc., with capital of \$50,000, and plan operation of local factory for manufacture of metal products. Edward Lux, Elkhart, will be one of heads of new company.

Central Auto Parts Co., Louisville, Ky., has leased four-story building at 424 North Illinois Street, Indianapolis, for new service, repair and garage building. Company is also planning to open four or five additional such units in Indianapolis, with facilities for parts production, etc. Harry Higson is president.

Board of Public Works, City Hall, Michigan City, has plans for a one-story municipal automobile service, repair and garage building. Samuel Boonstra, Warren Building, is architect.

Sheets Construction Co., Fort Wayne, recently organized with capital of \$50,000 and 1000 shares of stock, no par value, plans operation of local plant for production of architectural iron work, metal trim, etc. W. A. Sheets, Fort

Wayne, will head new company; C. E. Carter, Fort Wayne, will be an official.

Board of School Commissioners, Michigan City, is considering installation of manual training equipment in two-story and basement high school addition to cost about \$160,000, for which superstructure will soon be started.

St. Louis

CONTRACT has been let by Kansas Power Co., Topeka, Kan., to L. E. Myers Co., 20 North Wacker Drive, Chicago, for new steam-operated electric generating plant at Dodge City, Kan., to cost more than \$200,000 with equipment. Installation will include a 6000-kw. turbo-generating unit, two 600-hp. boilers, air heaters and auxiliary equipment. Sargent & Lundy, 20 North Wacker Drive, Chicago, are consulting engineers.

Henderson Products Co., Laclede, Mo., is planning to rebuild part of meat-packing and cold storage plant recently destroyed by fire, with loss close to \$100,000 including equipment.

St. Joe Lime & Stone Co., St. Joe, Ark., is planning to rebuild part of plant recently destroyed by fire, with loss of about \$100,000 including machinery. Company is an interest of Eastern Arkansas Lumber Co., St. Joe.

Kansas Power & Light Co., Topeka, Kan., will issue new stock in amount of \$24,600,000, part of fund to be used for extensions and improvements, including acquisition of United Light & Power Co., Kansas Pipe Line & Gas Co., Western Gas Co., Western Pipe Line Co., and other electric power and natural gas utilities. Different units will be continued in operation and expansion carried out.

Otto E. Schroers, 2107 South Grand Street, St. Louis, and associates have organized Multitex Corp. of America, Inc., with capital of \$1,000,000, and plan operation of local works for manufacture of a patented steel-glass product, to be known as Glassteel, comprising sheets of perforated steel coated on two sides with glass. Christian Andresen, inventor of product, will be president; Mr. Schroers will be secretary.

Atchison, Topeka & Santa Fe Railroad Co., 80 East Jackson Boulevard, Chicago, will begin erection of new engine house with shop facilities at Boise City, Okla., to cost over \$70,000 with equipment. G. W. Harris, address noted, is chief engineer.

Pacific Coast

CONTRACT has been let by Crown-Willamette Paper Co., 343 Sansome Street, San Francisco, to Austin Co. of California, Inc., 777 East Washington Street, for new one-story mill, 193 x 315 ft., at Los Angeles, to cost about \$300,000 with equipment. Two-story office building will be erected on adjoining site.

Fields Chemical Corp., Financial Center Building, Los Angeles, is negotiating for property at Long Beach, Cal., as site for new works for production of metallurgical coke and kindred products, to cost over \$140,000 with machinery.

Randolph Packing Co., San Dimas, Cal., is planning to rebuild part of fruit packing plant recently destroyed by fire with

loss over \$175,000, including mechanical-handling and other equipment.

Lake Elsinore Boat Works, Inc., Elsinore, Cal., recently organized by Ansil Holt, Elsinore, and associates, plans operation of local boat-building and repair plant.

Turlock Irrigation District, Turlock, Cal., Anna Sorensen, secretary, has plans for a power substation near Hilmar, Cal., with power lines to serve a distance of about 50 miles for irrigation service, to cost over \$80,000 with equipment. Engineering department is in charge.

Bureau of Reclamation, Denver, will receive bids until Sept. 11 for machinery for a power plant and pumping station near Prosser, Wash., for Yakima, Wash., project, including one 4200-hp. vertical hydraulic turbine with governor and governor pump, one 3000-kva. a.c. electric generator, complete with direct-connected exciter, thrust bearing, etc.; one power plant switchboard and one pumping plant switchboard, one horizontal centrifugal pump with capacity of 18 sec.-ft. when operating under head of 152 ft.; transformers, lightning arresters, switches and auxiliary equipment.

Department of Highways, State of Washington, Maynard Building, Seattle, has awarded general contract to Uebel & Gwinn, Central Building, for one-story equipment maintenance and repair shop, to cost close to \$35,000 with equipment.

Board of Trustees, Compton Union High School District, Compton, Cal., has asked bids on general contract for a one-story vocational shop at high school, to cost over \$35,000 with equipment.

Foreign

PLANs are being arranged by United Engineering Co., 1860 Broadway, New York, Russell W. Smith, president, for new plant near Havana, Cuba, for manufacture of paper book matches, to cost about \$325,000, of which nearly \$250,000 will be used for equipment.

Secretary of Stores Department, General Post Office, Wellington, New Zealand, is asking bids until Sept. 22 for 10 miles of annealed copper wire, quantities of vulcanized rubber insulated wire and other wire.

Plans are under way for organization of company for manufacture of rayon in Japan, headed by Yozaemon Fujikake, managing director of Tokyo Rayon Co., Tokyo, and Shingo Sakana, director of Nippon Petroleum Co., Tokyo. New organization will be capitalized at 10,000,000 yen (about \$5,000,000) and proposes to build a rayon mill at or near Tokyo, including power house machine shop and other units. Government has given contract to heads of new company for lumber in South Saghalien district, as source of raw material. Tsumetaro Sasaki, managing director of Kanto Gas Co., Kanto, Japan, will be one of officials of new company.

Ford Motor Co., Dearborn, Mich., and Ford Motor Co. of England, London, are arranging with Government of Spain to take over former plants devoted to production of war munitions at Trubia, Oviedo, and at Asturias and Toledo, Castile, for manufacture of Ford automobiles, including parts production and assembling. Structures will be equipped



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They're off . . . surging the waters with a terrific speed that tests the skill of the experienced and sets every nerve tingling with excitement. It is only complete control over the situation that keeps the surf-rider above the waters . . . or, that keeps H-P-M Hydro-Power astride your production schedule.

H-P-M HYDRO-POWER is truly a remarkable performer. It masters every metal stamping job with a new speed, power and accuracy that is absent in ordinary hydraulic presses, yet retains Hydraulic flexibility . . . a worthy factor when combined with the many exclusive H-P-M features for controlled press performance.

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Capacities from 100 tons to 2,000 tons. Square bed type bolster sizes; from 24"x24" to 84"x84"; open side bed type; from 60"x36" to 216"x72".



CONTROL

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Business as Others See It

Digest of Current Financial and
Economic Opinion

OF major importance in its effect on business was the result of the Prussian election, but it is too early to get the grist of economic opinion respecting it. The New York *Herald Tribune* on Monday regarded the defeat of communism as supplying the sign that "foreign bankers have been waiting for upon which to base reasonable expectations of German stability. No better measure could have been taken toward the regaining of foreign confidence. . . . The result contradicts flatly those prophets of gloom in Paris who have seen a collapse of the German Republic around the corner."

Numerous observers touch on evidences of a turning point in the

business cycle, but the Harvard Economic Society suggests fears that recent events (including particularly the European crisis) "are so unfavorable as to make renewal of the business decline conceivable." A favorable factor, this service points out, is the tendency toward a revival in demand for consumption goods; also "the apparent termination of great weakness in most commodity markets."

The Silberling reports are to the effect that statistical barometers indicate the near approach to a major turning point but as yet no definite bottom."

The Alexander Hamilton Institute finds a bit of negative encouragement in the likelihood that the

automobile industry may stage a revival similar to that of 1921. In that case curtailment during the last half of this year should be no greater than in 1928, a year of business improvement. Then there was a decrease of 2 per cent from the first half. Such a decrease for the current half year would give an output 32.8 per cent greater than that of the last half of 1930.

Theodore H. Price, in *Commerce and Finance*, is one of those who reports signs of scattered improvement in business, while D. W. Ellsworth, in the *Analyst*, believes we are too close to the events to be able to get a true perspective of developments either at home or abroad.

for average daily output of 100 automobiles.

Officials of Brown Boveri Co., Bern, Switzerland, are organizing a subsidiary to take over electric light and power properties at Cernautzi, Rumania, and vicinity. New company will be capitalized at 330,000,000 leu (about \$1,980,000) and will carry out expansion program. A fund of about 170,000,000 leu (about \$1,020,000) will be used for acquisition of properties and for improvements in plants and system. Municipality will have a financial interest in new company.

Machine Tool Companies Adopt Direct Selling

The Cincinnati Milling Machine Co. and Cincinnati Grinders, Inc., manufacturers of milling and grinding machines, announce direct sales representation in the Detroit, Chicago, Cleveland and Cincinnati territories. As a result of the increasing demands coming from users of machine tools in these territories for field technical service direct from the plant, this new direct factory representation will soon be put into effect.

Engineers, thoroughly experienced in milling and grinding methods, will serve the manufacturing industries in those territories. Offices will soon be opened in Cleveland, Detroit and Chicago.

In all other territories dealers will be maintained and the direct factory representation through milling and grinding specialists working in conjunction with dealers will continue as heretofore.

Financial Reports

Crucible Steel Co. of America and subsidiaries report for the six months ended June 30 net earnings of \$482,830, after interest, charges and taxes, equal to \$1.93 a share on the 7 per cent preferred stock. In the first half of 1930, the company earned \$2,317,773, equal, after preferred dividends, to \$2.62 a share on the common stock.

Detroit Steel Products Co. reports a net loss of \$192,923, after all charges, for the first half of 1931, compared with net loss of \$145,828 for the same period in 1930.

Pittsburgh Steel Co., Pittsburgh, in its fiscal year ended June 30, had net loss of \$1,765,638, after interest, depreciation, taxes, etc., compared to a net profit in the previous year of \$1,683,149.

Timken Roller Bearing Co., Canton, Ohio, reports profits of \$2,462,714 for the first six months. Earnings during this same period last year were \$6,120,023. The first half earnings amount to \$1.02 a share. The company declared a quarterly dividend of 50c. a share, reducing the annual rate from \$3 to \$2.

Notes of the Industry

Waldo, Egbert, Maltby & Ward, Inc., Pittsburgh, seller of pig iron, coal, coke, ferroalloys, etc., discontinued business as of July 31. The Wieman & Ward Co., which became a part of the other firm about a year ago, has again resumed business, with offices at 1844 Oliver Building, Pittsburgh, and will continue the sale of

coal and coke with its original personnel. Waldo & Maltby, Inc., Liberty Bank Building, Buffalo, has been reorganized and will be agent for the sale of pig iron of the Wickwire Spencer Steel Co., Buffalo, and for Niagara automatic stoker and Durbar high lead-bearing bronze.

International Nickel Co., New York, has issued Nos. 1 to 8 of its recommended specifications for nickel alloy steel in railroad applications. These cover forging billets, normalized and tempered low-carbon forgings, boiler and firebox plates, castings, nickel engine bolt steel, low-carbon main frames for locomotives, nickel stay-bolt steel, and nickel cast iron for cylinders. The data are presented in similar form to that used by the American Railway Association for its standard specifications. Additional specifications covering other nickel alloys used in railroad applications will be issued from time to time.

Despatch Oven Co., 622 Ninth Street, S. E., Minneapolis, has appointed Jones & Manter Corp., 120 High Street, Boston, its sales representative in the New England district, excluding western Connecticut; F. C. Butman has been reappointed district manager of the western New York territory, and E. B. Wolf has joined the Detroit office of the Despatch company to assist in sales in the eastern Michigan and northwestern Ohio territory.

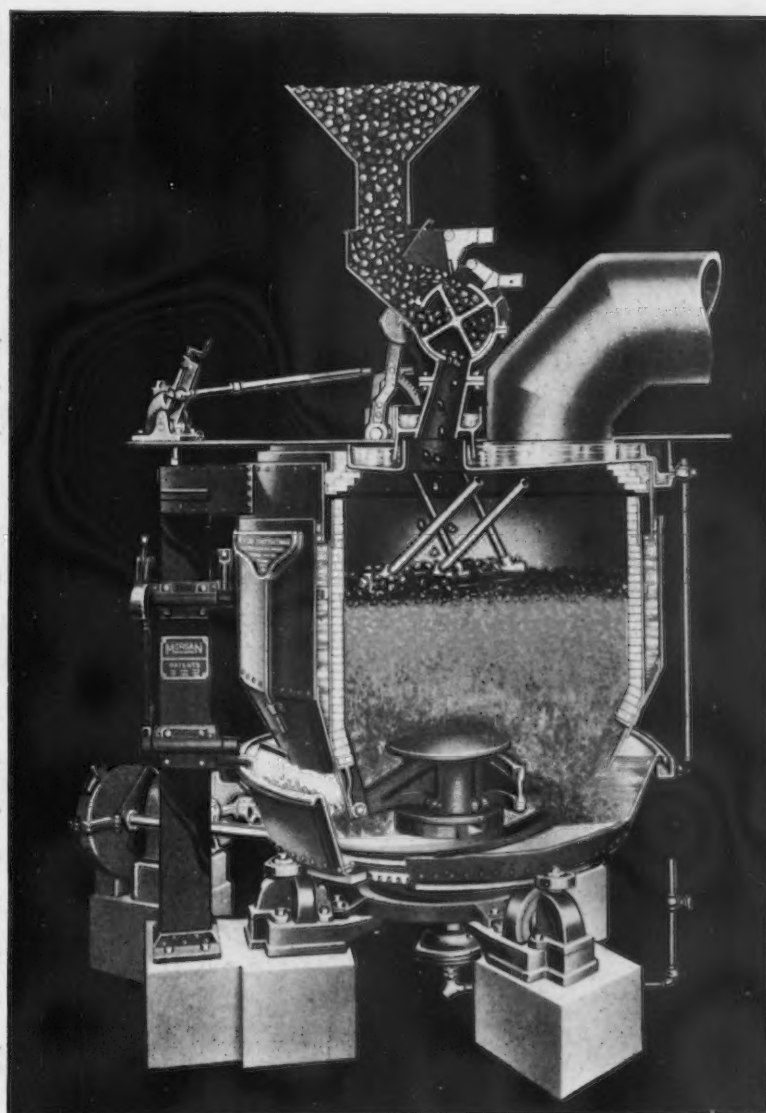
American Steel Package Co., Defiance, Ohio, is advancing operations in its radio department, following receipt of large orders for condensers from Crosley Radio Corp., Cincinnati. Company is now giving employment to about 200 persons, which will be increased within the next 60 days.

AUG 19 1931

THE IRON AGE

MANAGEMENT
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DESIGN
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NEWS
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MARKETS
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High Capacity=100% more coal gasified per man.

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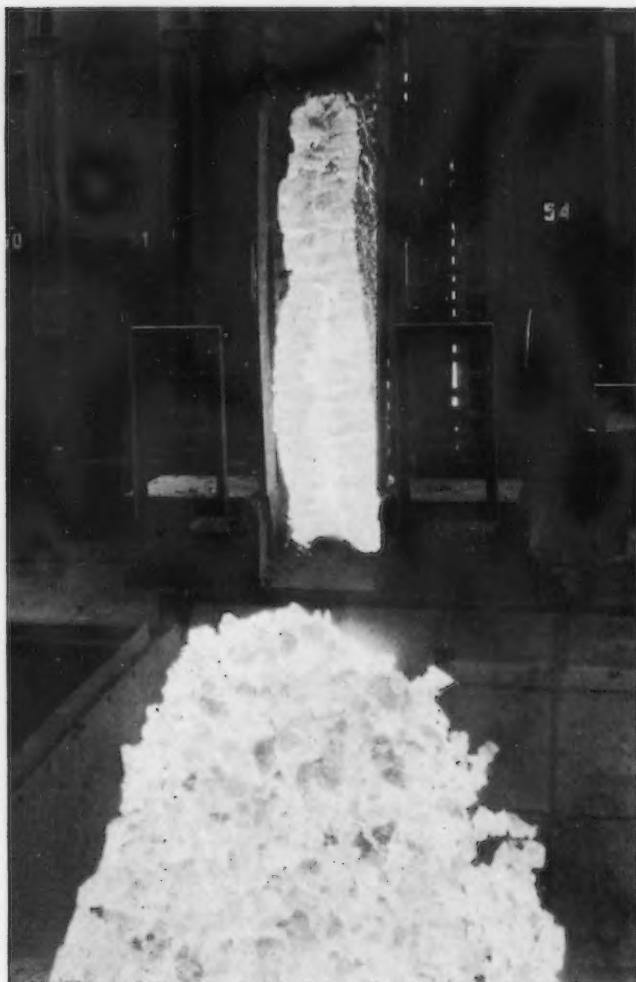
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AUG. 20
1931



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Cities can point with pride to Koppers plants producing gas and coke, as clean, diligent servants of the community. Smoke, smell and grime are not By-products of that service. These plants, engineered in the light of important research by Koppers, tempered by long experience in meeting community needs, provide clean, efficient production facilities.

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